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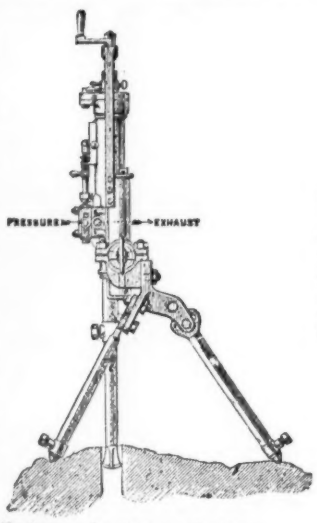

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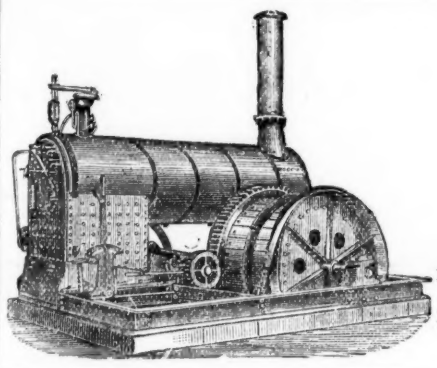

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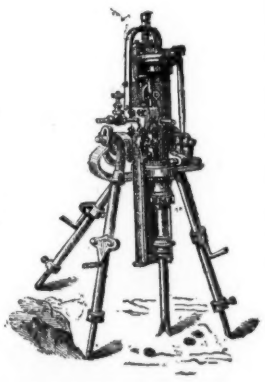

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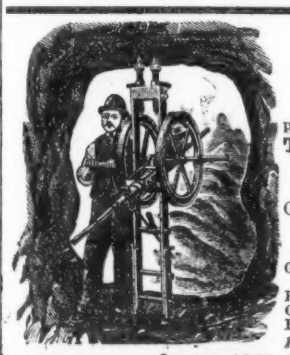

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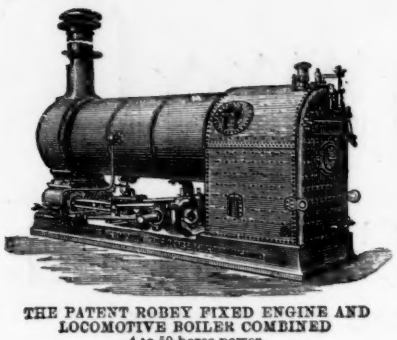

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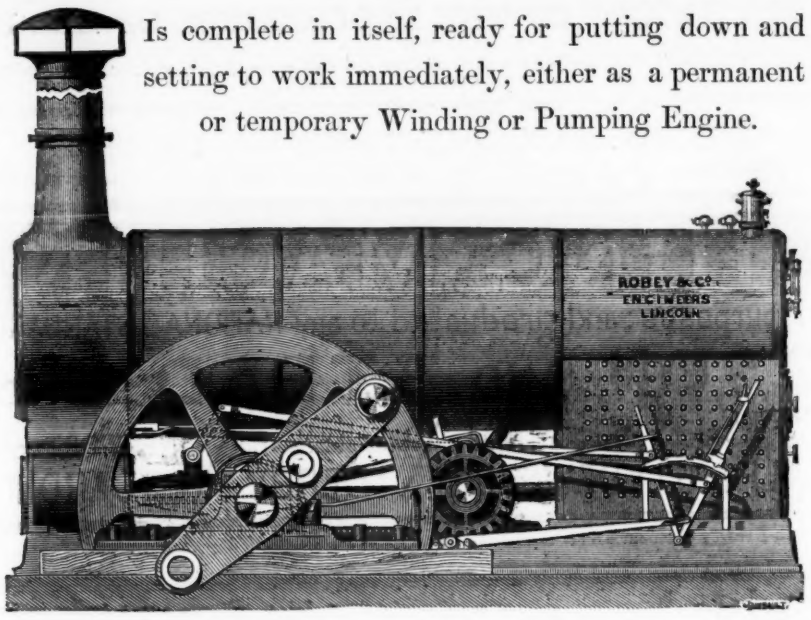

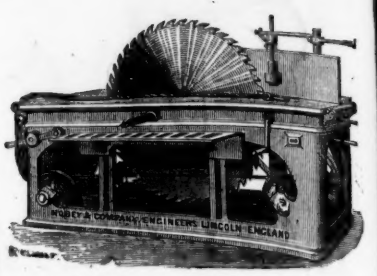

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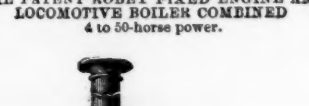

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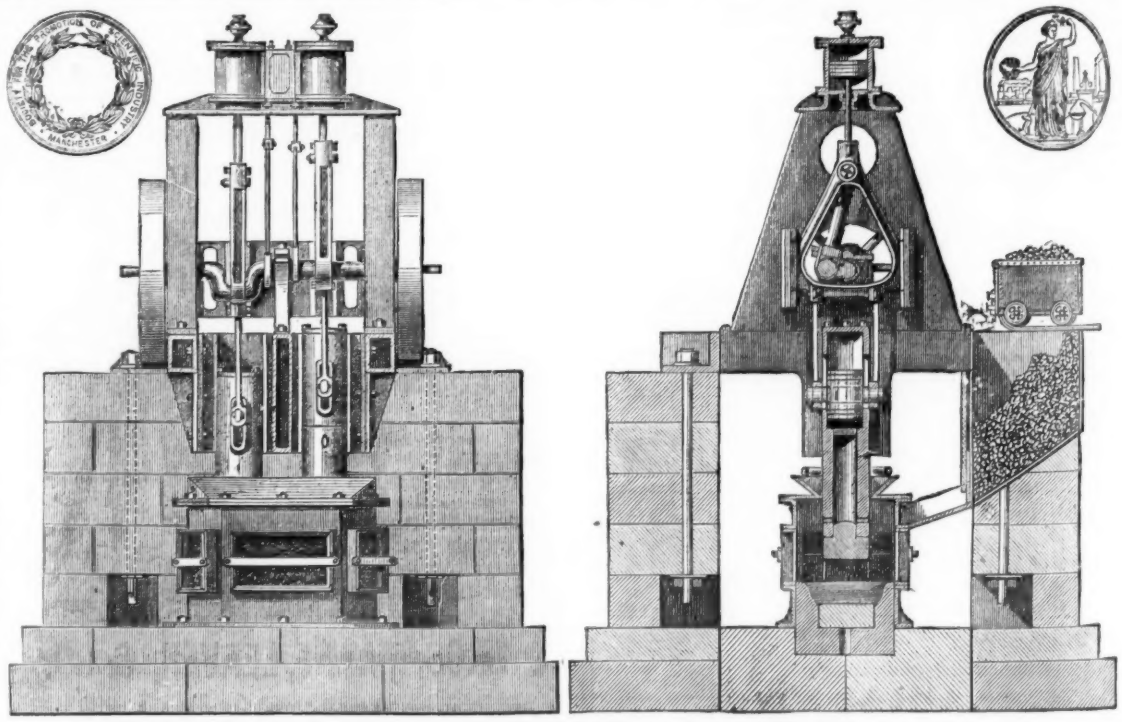

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Original Correspondence.

THE COLOURING OF THE GEOLOGICAL SURVEY MAP OF THE SOUTH-WEST OF IRELAND.

SIR,—Referring to the letter of your correspondent "F.G.S.," which appeared in last week's Journal, allow me to state that, as he observes, a revision of the maps of the South-West of Ireland has been sanctioned by the Director-General, and is now in progress. When completed, these maps (in which "the Glengariff and Dingle beds" will be separated from the Old Red Sandstone and Carboniferous formations) will be substituted for those now in circulation. This revision will necessarily take some time for completion, but great progress has already been made.

EDWARD HULL,
Director of the Geological Survey of Ireland.

Hume-street, Dublin, Feb. 17.

MINING IN IRELAND—No. VII.

CONVERSATION BETWEEN A FATHER AND SON.

SON.—Have you finished with the Silvermines district.

FATHER.—I wish to inform you that the Silvermines have been largely worked at a much later period than my last remarks have reference to, not, indeed, for silver, but for zinc ore (calamine), which the place yielded in large quantities. The ore that gave a high percentage of metal was exported, while the lower grade ores were treated on the ground, distilling off the metallic zinc, and bringing a large amount of atmospheric air in contact with the sublimed metal converted it into (a white powder) oxide of zinc, a substance which is largely used as a pigmen.

SON.—The process must be very interesting, father.

FATHER.—And would have doubtless paid well where fuel and labour are so cheap as in Ireland, but I have been told there was a screw loose somewhere, not unlikely in the management, which, in the interest of honest and legitimate mining, I cannot forbear to mention.

SON.—Is there not very rich land somewhere in that vicinity?

FATHER.—That portion of Limerick and Tipperary known as the Golden vein is, perhaps, the richest land in the world.

SON.—Are there any mines or mineral indications where the soil is so rich?

FATHER.—Fringing the Golden vein on the Waterford and Limerick Railway, and near to the village of Oola, some mining has been carried on for lead ore in the lower lime formation. Quantities of rich silver-lead have been extracted from a pipe or shoot of ore that was discovered cropping out at surface, but little, however, has been done in extending out levels or galleries on the lodes, which are of an exceptionally promising character, so much so that I doubt if there is a better prospect for opening up rich silver-lead mines in any other portion of the kingdom.

SON.—The improved state of the lead trade will doubtless lead to the opening up of such places as you have just described. By the way, you should take me to Ireland your next trip, father.

FATHER.—It will afford me great pleasure, John, to take you on my next mining tour to Ireland, and give you some practical lessons in mineralogy, geology, &c.

SON.—I hope, father, you will take me to some localities where there are the two orders of lodes you spoke of the other day, so that I may learn the difference between a mere ordinary vein and a champion or main lode.

FATHER.—You shall have that information without fail.

SON.—No doubt all mining agents are well up in such matters, though you hinted some time since that money should never be spent in pursuing a Will-o'-the-Wisp, or mere strings of quartz with metallic indications, unless the conditions were such as to give prospects of strength and continuity in depth.

FATHER.—Mining agents as a rule do the best they can, as it is to their interest to get as much ore as possible, yet the best men have been often led away by indications so as to spend money in shallow workings, which would be spent to far greater advantage in deeper workings on the main lodes.

SON.—Perhaps you would say that the proper course to pursue would be to attack the main lode or lodes first, and concentrate your energies there until such time as you had worked out the ore and exhausted the best portions of the property, after which you would cross-cut to other lodes to ascertain their value.

FATHER.—That is not exactly what I mean. In a mine where there are several lodes I would first concentrate my energies on one or two of the best lodes till I had made good and substantial returns, and laid open large reserves of ore, after which I would proceed cautiously and one by one to test the nature of the other lodes if indications warranted such a course. If, however, I saw that they were merely feeders to the main lodes I would only attack them where the points of junction with the main lodes occur, and then not drive on them beyond where ore may be extracted with profit.

SON.—Is there anything more of interest in this part of Ireland?

FATHER.—In the clay-slate country south of Silvermines are several metalliferous lodes. In Knockeenroe a powerful vein, consisting of quartz and iron pyrites, with some galena, ranges nearly east and west, and may be traced for a considerable distance until it sinks under the sandstone which caps the hill; in the latter part of its course it contains copper pyrites; this vein was examined by Mr. Taylor, who after some trial gave it up, and then the Mining Company of Ireland, at the time when the monopoly of the sulphur trade had led to active demand for iron pyrites, essayed to work through the great mass of sulphur ore, hoping that its sale would enable them to finally ascertain the prospects of copper ore in depth, as it is an old saying that mundic rides a good horse. It was found, however, that the inland position of the mines and the refractory nature of the rock rendered the iron pyrites raised too costly for sale in the English markets, and hence the company abandoned the investigation without having penetrated through the vast body of sulphur ore which forms the surface of the vein.

SON.—Do you consider the chances of copper ore in depth are very good, as you say it is an old saying that pyrites rides a good horse.

FATHER.—Analogy points to such a conclusion, especially in large and powerful veins. Dr. Kane also wrote of this district in 1845 as follows:—"In the valley of the Newport river are situated the mines of Lackamore; the lode consists of carbenate of lime and iron, bearing rich copper ore in bunches. This mine has been long known and worked. In 1812, when Mr. Weaver wrote, the workings had extended 120 fms. in length at a depth of 30 fms. After that they were abandoned, but have been recently brought into activity. There are now about 200 persons employed, and there were sold at Swansea in 1840 from this mine 111 tons of ore, which produced 1153*l.* 7s., and in 1843, 260 tons of ore, which realised 2386*l.* 18s."

SON.—Is there anything more of interest in the Limerick and Tipperary districts?

FATHER.—There is much that I would wish to describe if the time permitted.

SON.—Are not the celebrated Killaloe Slate Quarries somewhere in this vicinity?

FATHER.—Yes, but we will speak of them at some future time under the head of Irish quarries; suffice it to say at present that the Killaloe slate is very abundant and of first-class quality, and that these counties teem with rich and varied mineral and other products—for instance, we have already enumerated coal, lead, copper, and slate. The limestone quarries, moreover, along the Waterford and Limerick Railway are capable of producing vast quantities of very superior building stone, while most of the plains afford thick beds of beautiful plastic clay, rich in silica, and that may for the mere trouble of it be converted into bricks, tiles, sanitary, drain pipes, &c., all of which the country itself stands so much in need. We will now proceed with lead mining in other places, dating back some 30 years ago.—"The lead mine situated on the hill of Ballycorus contains two lead veins, which at the surface are nearly parallel, and cross the junction of the granite and mica slate which takes place on the summit. In the workings these veins have been found sometimes to diverge, and at others to coalesce, and were then in every case found to yield valuable bunches of ore. These veins had latterly, however, become unproductive, and although some limited explorations were still carried on by the Mining Company this mine was not reckoned as being at the present time in actual work, but within the last few months it has assumed a new interest by the vein of lead ore being found to contain a rib of native silver, the condition of which will be described more fully further on. In its vicinity are situated the Mining Company's smelting works, to which all their lead ores are brought for the purpose of their reduction and manufacture. On the northern side of Glenmaulur, where the granite and mica slate join in Lugduff Mountain, a powerful metalliferous vein presents itself, forming an acute angle with the course of the valley. It has been traced for above 400 fms., but probably extends much further. The vein as described by Mr. Griffith is, on an average, 15 ft. thick, and excepting where there are bunches of ore is divided into five parts. There are 3 ft. of a soft slatey vein, containing much talc, then a vein of white quartz from 1 to 3 ft. thick, which usually contains ore, next 3 ft. of soft talcy matter similar to the first, then 2 ft. of quartz in which most of the ore has been found; finally, a third layer of the soft talcy matter extends to the opposite wall of the lode. The lead ore of this mine is considered to be unusually free from zinc and antimony; it has yielded very abundant produce, several large bunches or masses of ore having been met with in the course of the workings. The productiveness has, however, latterly diminished; the number of persons employed on it is at present about 30. On the same and on the opposite side of Glenmaulur several other veins containing indications of lead have been discovered, but no serious trials have been made. The clay-slate districts which have been found so rich in copper yield also abundant indications of lead, but up to the present time few of the mines that have been worked have yielded a profitable return; of very few of them have there been as yet detailed examinations made, and hence it will be sufficient to notice them succinctly. At Cairne in Wexford the clay-slate is penetrated by a vein of quartz ramifying very much and bearing galena, white lead ore, sulphuret of zinc, with copper and iron pyrites. This vein is of considerable magnitude, at 47 fms. in depth being 12 ft. wide. Several years ago some quantity of copper ore was exported from this mine, and also large quantities of galena, but it was abandoned until a few years back, when its working was resumed by the Mining Company of Ireland, but it is questionable how far its working may be profitable at deep levels. The lode is considered to yield abont 3 tons of ore per fathom. The quantity of dressed ore obtained was—In 1842, 505 tons; 1843, 270 tons. The ore usually contains 75 per cent. of metal, and is sent to Ballycorus to be smelted. The number of hands employed is about 130. In the clay-slate of the North of Ireland, which spreads over the counties of South Armagh and Down, several lead mines have been opened. In Armagh, at Derrynoos, a vein of lead ore was worked for several years by the Mining Company of Ireland, but finally abandoned; it yielded about 200 tons of dressed ore per annum. At Keady in the same county a vein of lead was found, of which Sir Charles Coote in his survey of Armagh speaks in the followiug words:—This mine is on the estate of the College of Dublin; the lands are held by the Earl of Farnham; the late Earl expended large sums in sinking and working, but made no profit of it. It is rather wonderful, and indeed proves the value of these mines, that he was not a considerable loser, as he had no active partner to superintend works underground, which he never saw himself. The vein is so rich and abundant that it would be well worth the attention of the moneyed undertaker; this attention, as far as I can learn, has not since been given to that district. In Down, at Clonligg, near Newtownards, is a lead mine which is at present worked to a moderate extent. At Dundrum in the same county a vein containing lead ore has been discovered, and superficial trials of it made. In the slate districts of the south of Ireland veins containing lead have been found at Ardmore in Waterford, and in several of the localities already mentioned as the depositories of copper ore."

SON.—Have you brought lead mining to a close, father?

FATHER.—We have not exhausted the subject yet, and will speak of Kerry and other localities in our next conversation.

SON.—Speaking of Cork and Kerry reminds me of the incorrect marking or colouring of the geological maps of these counties, which "F. G. S." draws attention to in the Supplement to last week's *Mining Journal*. He also invites discussion, and quotes some very high authorities in support of his views.

FATHER.—It is beyond question a very great evil that the shales and grits of Cork and Kerry should be designated in the Government maps as Old and New Red Sandstone, as I have no doubt whatever on my mind but they are incorrectly marked, and I should like to see the matter thoroughly ventilated, even so much so as to induce the Irish Members of Parliament to take the matter up, and agitate for the appointment of a Royal Commission of scientific and practical men to investigate and finally settle so important a question.

New Cross, London, Feb. 17.

THE LONDON COAL SUPPLY.

SIR,—It appears to me opportune, on reviewing the accumulated and redundant correspondence on this engrossing subject in the Journal, that, with your permission, I should concentrate—"coordonner"—my views as succinctly as practicable towards solving a problem of the very highest import to the weighty interests at stake the coalowners, the miners, and the metropolitan coal consuming public. The solution is based upon a greatly reduced rate of practical transport and immunity from loss by breakage, as shown in the sequel, giving the coalowners an enhanced and remunerative price, and the consumers coal direct from the collieries at a vastly reduced cost upon such by rail from the collieries nearest London, or seaborne from the Tyne. I shall endeavour to render my seaborne transit as intelligible as possible in the limited space indulgently placed at my disposal, corroborated by elaborate and practical data.

I propose the formation of a company, having for its primary object the supply of the Metropolis with seaborne screened coals, in sacks, direct from the collieries, at a great reduction to consumers upon existing and for many years current selling prices, simultaneously with an enhanced price to coalowners. Screened Silkstone coal, purchased by said company at 8s. per ton at the pits, will cost them from the pits into consumers' cellars 17s. 6d. per ton—coal, transport, and all charges. Taking into consideration that, according to Engineer, Engineering, and Iron, identical coals have been selling at 5s. at the pits, the cost delivered into London consumers' premises would be reduced to 14s. 6d. a ton, selling currently in London at 22s. to 23s. cash, and 24s. to 25s. on credit. Derbyshire and Nottinghamshire coals, *via* Boston Deeps, will cost the company so delivered 17s. 6d. per ton. The hard steam coal from precited coal fields, purchased by the company at 8s. a ton at the pits, will effect a saving of 20s. per ton upon the actual cost of Welsh smokeless steam coal with attendant expenses to the steamship owners, as hereinafter shown. An Admiralty report shows that "upwards of one-fourth small or dust, termed useless refuse, passes through a ½-in. screen in smokeless Welsh steam coal." Inspecting engineers of steamers *via* Suez and the Cape admit one-third small and dust is delivered into the bunkers along with the bulk. A printed circular of the chief Welsh coalowners states—"It is a general complaint that our small will not bind, and falls through the bars to waste." Calculating the cost of Welsh steam coal in bunkers at 17s. per ton, one-third useless refuse—5s. 8d.—taking up the room of freight averaging 40s. per ton—13s. 4d.—the actual and intrinsic cost to the steamship owners is 36s. a ton, rendering it unnecessary to revert to an Admiralty report showing the Yorkshire steam coal to be equal in evaporative power with the Welsh, and to surpass the Newcastle, with greatly less clinkers and ashes than either. As a rule, there is no effective check under existing system as to weight, as much as 12 tons short weight in a single barge-load in London having been recently legally proven, which the proposed sack system obviates. Considering the onerous expenses of detention, &c., incidental to coaling stations, the injury to machinery through coal dust, extra friction, wear and tear, additional labour, and stoking, with the difficulty of keeping up steam fluctuation rendered less frequent by cleaning out the fires so often, the surcharge of small coal is difficult, even with the greatest draught, to render incandescent in the case of Welsh coal.

The preponderating element of saving is dispatch, through the steamers not being exposed to the detention inseparable from loading in docks, as in the Tyne, the Hartlepools, the Humber, and Welsh ports, in strict harmony with the evidence before the Thames Traffic Committee, eschewing the fogs and intricate, dangerously crowded navigation of the Thames, loading in the Humber and Boston Deeps from and discharging into decked lighters in the Orwell, all three accessible at all states of the tide, and in all weathers, with no impediment to immediate loading and discharging on arrival. The steamers are fourfold, the cargo capacity of the 1879 Coal Exchange returns, with end to end hatchways, and 12 hydraulic cranes each, immunity from small through conveyance in sacks, amounting to 35 per cent. on the cost of Silkstone coal at the pit's mouth, as precited. The Chairmen of the London and North-Western and the Great Eastern Railway Companies, the General Managers of the Midland, Great Northern, and Great Eastern Railway Companies have proved the impossibility of railways competing with water conveyance. The immense outlay by the French Government in the improvement of water communication at the present moment for the Paris coal supply fully proves the vast economy of water over rail transport of coal. Similar proofs can be adduced from the United States of America, India, &c.

I propose that a commencement be made with a capital of 200,000*l.*, in 1*l.* shares, with power to increase. The conveyance will be effected by means of Boydell's endless railway traction-engine and trucks from the pits contiguous to and situated at a distance from inland navigation to the decked lighters in the Ouse, Trent, Witham, and Aire and Calder navigation, thence to the sea-going steamers in the Humber and Boston Deeps, discharging in the Orwell into decked lighters for delivery in London, and subsequently by the usual process to consumers' premises.

W. JOSEPH THOMPSON.

Little Tower-street, Feb. 16.

ON AIR COMPRESSORS.

SIR,—So much attention is now being given to the subject of compressed air, and so varied are its applications for mining purposes, that there is no doubt air-compressing machinery will in time form a part of the plant of every colliery, more especially the deep mines and those where a high temperature prevails. Air compressors are now designed for use in mines of coal, copper, iron, and lead, as well as in tunnels and quarries. They are also largely used for driving coal-cutting machines, underground hauling and pumping engines, rock drills, and for ventilating purposes. Air compressors are made in various forms, that of Sommeiller's—used in driving the Mont Cenis Tunnel—being one of the earliest; the principle of the water piston was adopted by him, the cool water and air coming in contact tended to keep down the temperature of the air, and thus prevent the loss of power arising from highly heated air escaping from the compressor. Some improvements in this form of compressor have been devised, and are used to some extent on the Continent. The principal objects gained being more perfect cooling of the air and a greater piston speed, which increase very much the advantages of this type of air compressor.

The more modern form of air compressor used in this country consists of a steam-engine and air compressor combined, with one crank-shaft, the cranks being set at right angles to one another; by this means the greatest power is exerted in the steam cylinder when the greatest resistance is given in the air, thus securing uniformity of motion. These machines are made by Messrs. Warsop and Hill, of Nottingham, up to pairs of 22-in. steam cylinders, with pairs of 22-in. compressors, and 4-ft. stroke. The machine combines efficiency with great strength, the whole being fitted on one bed-plate, to render the fixing as simple and perfect as possible. The heat liberated from the compressed air is to a certain extent absorbed by a system of water lubrication in the form of spray, increasing greatly the efficiency of the machine. Special means are used by these makers for preventing the formation of ice in the machines driven by their compressor.

The steam-engine and air compressor are so made that they can be uncoupled, and the engine used for any other purpose where temporary steam power is required. The compressor may also be utilised separately; it may be driven by a belt and pulley from a line of shafting, or by a portable engine direct, or from a belt; also by a water-wheel in the same way, or by gearing worked by horses. The compressor of 12-in. diameter and 16-in. stroke may be driven at a piston speed of 350 ft. per minute.

Warsop and Hill are manufacturers of the Economic Coal-Cutter, which, though not used yet to any extent, is exceedingly simple and light in construction, its length being 7½ ft., breadth 2½ ft., and height 2 ft., the weight is about 15 cwt. Like other machines of this class it is designed to be actuated by compressed air, the pressure being 25 to 30 lbs. per square inch, varying with the density of the coal to be undercut. The cutter bar, which is the distinguishing feature in this machine, has a spiral thread with cutters fixed on it, undercuts to a depth of 3 ft. and height of 3 in., and at the bottom of the seam if required. The simplicity of construction and lightness of this machine are in its favour; if the cutter bar efficiently performs the work required of it, this coal cutter will take its plsce among others now in operation in coal mines, though only to a small extent adopted.

Economy of power, and durability with efficiency, are the essential points to be obtained with coal-cutting machines; the portability of the machine and its application in a small compass are too little considered by inventors. When these are secured their success in time will be certain to come. The application of compressors nearer to coal cutters than the top of the pit would also increase greatly their utility and extend their use. So far this has been sought to be overcome by using horse power, which is too limited in power to drive coal cutters as at present made, seeing that an air compressor with 10-in. cylinder is often required, with a long line of pipes, to drive one coal-cutter, the power varying with the diameter and length of pipes; but where the compressor can be placed near to the work to be performed the friction and loss of power with pipes is greatly avoided, and economy of power and expenditure is also effected.

M. E.

CONSOLIDATED MINING COMPANY.

SIR,—Enclosed I beg to send you copy of a letter addressed to one of our directors—Mr. Edward Applegarth—by Captain Frank Drake, our agent in Nevada. By the courtesy of Mr. Applegarth this letter was read at a meeting of our board, held this morning, and I am requested to send it to you for favour of publication in your next issue. This letter was written prior to the appointment of Capt. Drake as agent to this company.

ARTHUR D. GRIFFITH,
Assistant Secretary.

London, Feb. 18.

Eberhardt, Nevada, Jan. 29.

SIR,—You will please pardon me for making a few remarks and suggestions which I propose to offer to you at this time (gratis you know). Knowing that you are one of the directors of the South Aurora Company, I shall address you as such for the benefit of the board. I consider the directors and the entire list of shareholders of this heretofore unfortunate company have advanced a round upon the ladder of prosperity by the fortunate and favourable discovery which has been made of late in the driving of the Eberhardt and Aurora tunnel through your ground. You have already been apprised through the Eberhardt and Aurora office of the favourable prospects and of the location which has been made at point in tunnel of 4875 ft. I beg now to give you such information as I can in connection with the location, &c.

As you are aware, at the commencement of the Eberhardt and Aurora tunnel there were plans and surveys drawn, giving the position of the several patented grounds along the line of the tunnel. These surveys and plans were calculated and made from the starting point of tunnel, and are presumed to be correct, yet Mr. T. J. Read (the surveyor) deems it necessary, in order to prove his work, to take the point of location of the South Aurora Mine, and survey south, or down the hill, and establish point over tunnel, and drop a line to level of tunnel; this work should be done at once by the mutual consent of both companies. This line being correctly established, it would enable me to give you the distance run in your ground. At the present time I am unable to determine the exact point in the late discovery through which your line passes, yet I think it is safe to say that the greater portion of the ore body is in the South Aurora ground. The ore found is not in large quantities, neither is it of high grade, yet it is sufficient to satisfy the most sceptical that there is ore at great depth in old Treasure Hill, and, judging from the very rich deposits that have been found near the surface, we can safely expect large bodies of ore below. As for myself, I have the greatest confidence in the final result of your property. This body of ore should be opened out, and I would suggest that you should devise means whereby it could be done. I do not know the financial standing of your company, but should you not have the money in hand it could be easily raised upon so good a showing. To show you my confidence in the outlook here, and believing that by judicious and energetic work your property could be made profitable, and in case you are obliged to raise money upon debentures for this purpose you can put me down for a starter. It is not necessary, nor is it in place for me to lay out plans for working or estimates of cost for same to your company, but allow me to give it as my opinion that this work can be done for less than the average cost for doing the same amount of work in the majority of mines.

Should you conclude to commence operations immediately, I would suggest

that your board of directors should confer with the Eberhardt and Aurora directors for the purpose of arranging with that company for use of machinery, &c. I can see no reason why such an arrangement cannot be made upon satisfactory terms to both companies. I would be pleased to give you at any time, and upon any point which you may desire, my opinion or assistance, so far as it would be compatible with my position in the Eberhardt and Aurora Mining Company.

FRANK DRAKE.

MEXICAN BONDS.

SIR,—If honour and integrity have not ceased to exist in Mexico it is to be hoped that the formation of a bank, as now proposed, may aid Mexican bondholders to obtain their just rights. I speak more particularly of the Mexican loan of 1851. On bonds of that loan I find 31 coupons have been paid, leaving 17 unpaid. It is surely not worth while for a great country like Mexico to be so dishonest as to leave these coupons any longer unpaid. On each bond the following statement appears from the Bondholders Committee:—

"That as this concession thus unreservedly made by the foreign bondholders, added to their former sacrifices, amount to about twenty-three millions of dollars, this meeting entertain a sanguine hope that their generosity will be appreciated as it deserves by the Mexican Government." The Minister of the General Treasury endorses on each bond that "the Government of Mexico do solemnly promise and engage that all and each of the conditions of the said decree shall be duly and faithfully observed and kept."

They have not been kept. Englishmen trusted to the honour of Mexico to repay their money. Probably Englishmen might have done better had they employed their capital in developing the resources of the British Empire in place of lending Mexico money. However, there ever are, and probably ever will be, a large supply of fools in answer to the general demand for that article. In the meantime let Mexican bondholders press upon the Mexican Envoy who has come to England recently the necessity of recognising their just claims.

S. C.

EUREKA CONSOLIDATED AND THE RICHMOND MINES.

SIR,—The accompanying comparative statement will interest old and new Richmond shareholders. The Eureka Consolidated have done exceedingly well on very low-grade ore, which averaged $7 per ton less than the Richmond ore. The net yield was the same, but the working expenses were $7 per ton less in the case of the Eureka Consolidated. If the Richmond could have worked as economically as their neighbour the additional profit to the shareholders would have been $528,304, or nearly 2*l.* per share.

A SHAREHOLDER.

Feb. 18.

Product and expenses as rendered to the assessor of Eureka County, Nevada, U.S., from July 1, 1877, to Oct. 1, 1879.

	Eureka.	Richmond.
Number of tons of ore worked.....	157,440	75,472
Gross value or yield at Eureka.....	$6,128,378	$3,459,320
Cost of mining.....	934,715	682,652
Cost of transportation to furnaces..	131,040	100,981
Cost of reduction.....	1,766,985	1,122,250
Total cost of mining, transportation to furnaces, and smelting	2,832,740	1,905,882
Net yield or profit	3,295,638	1,553,438
Gross value per ton of ore.....	39	46
Net yield per ton of ore.....	21	21
Cost of mining per ton of ore	6	9
Cost of transportation per ton of ore	0·83....	1·33
Cost of smelting per ton of ore ...	11·22....	14·87
Cost of mining, transportation, and smelting per ton of ore	18	25·20
Percentage of profit on gross value.	54 per cent.....	45½ per cent.

THE RIO TINTO MINE

SIR,—Having read the letter relating to the above mine which appeared in the *Mining Journal* of the 31st ult., signed "A Shareholder," I think it may be useful if your readers are reminded of the following paragraphs which will be found in the directors' report read to the shareholders at the general meeting held on April 23, 1873:—

PURCHASE OF MINES.—Referring to what was said in the former report, your directors have to state that after protracted negociations the conversion of the company's pagares into 5 per cent. bonds, repayable in 80 years, is now on the point of completion.

The arrangement with the Spanish Government and the Council of Foreign Bondholders is briefly to this effect—That on surrender to the company of the original pagares 5 per cent. bonds will be issued for a total not exceeding 2,200,000*l.*, redeemable over 20 years, and secured by a mortgage deed to trustees. The annual charge to the company under this arrangement, including the accumulative sinking fund of 3 per cent., will be 176,000*l.* per annum for 20 years.

In calculating, therefore, the probabilities of an early payment of dividend on the company's shares and its amount, it is clear that a deduction from the profit realised upon sales must first be made to meet the above "annual charge" before any profit can be appropriated for division as dividend. In the published statement of accounts to Dec. 31, 1878, the interest only on the above mortgage bonds or debentures has been charged to profit and loss or revenue account, and the payment of the mortgage bonds themselves has been met by money borrowed for the purpose. Surely until this borrowed money has been repaid from revenue account there cannot be any profit which can be lawfully appropriated as dividend. Is not the above "annual charge" of precisely the same character as mine rent or royalty?

The current open cash liability of this company is stated in the balance-sheets to have been as follows:—At Dec. 31, 1876, 917,903*l.*; at Dec. 31, 1877, 1,297,215*l.*; at Dec. 31, 1878. 1,478,124*l.* These figures show an increase of 560,220*l.* within a period of two years.

Cornwall, Feb. 18. INVESTOR.

UNITED STATES ROLLING STOCK—NERBUDDA COAL AND IRON COMPANY.

SIR,—Will you allow me space in the Journal to call attention to an investment that has a most promising future—the United States Rolling Stock Company? The increase of railways in the United States that is now taking place will necessarily involve large additional outlay in locomotives, cars, wagons, trucks, &c., and consequently the annual replenishment of rolling stock by each railway company will also be greatly increased. These circumstances greatly enhance the value of the shares of this company, upon which much larger dividends may be expected to be paid for the ensuing year.

There is also a low-priced investment that appears to be quite overlooked—the Nerbudda Coal and Iron Company, the shares of which stand at about only 10s. The company has had great difficulties to contend with, but bright prospects are now appearing, and in the last report the manager had the satisfaction to write as follows:—

"In concluding my report I may remark that though the output has been anything but satisfactory, the work done under the difficulties with which we have had to contend has been great; and I can conscientiously say that never before have the explorations proved so thoroughly the large extent of coal in the company's concessions, and in this statement I believe I may venture to say I shall be corroborated by Mr. Medlicott, the Superintendent of the Geological Survey of India, who has recently visited these mines."

In 1875 a dividend was paid of 7½ per cent. Since that time a large amount has been spent in new machinery, and now everything is progressing most favourably.

VERITAS.

YORKE PENINSULA MINING COMPANY.

SIR,—It is evident that the writer of the letter signed "X." in last week's Journal is very desirous that the shares of this company shall not be unduly appreciated. I, on the other hand, am desirous only that they shall not be unduly and unfairly depreciated. In the first letter by "X.," which appeared in the Journal of January 24, and in which (by the use of such expressions as "study of their last balance-sheet and accounts," "I fear we must wait," and "before we can expect," &c.) he implied that he was writing as a shareholder bent on keeping the investing portion of the public accurately informed, he stated that the accrued interest on the preference shares of the company amounted "to over 40,000*l.*" That statement was corrected by my letter in the Journal of January 31, in which I stated that the interest was about the one-half of what "X." had represented it to be. In answer to such correction "X," in last week's Journal, refers—not to the balance-sheet and accounts, as before—but to "the report of the last meeting of the company," and alleges that the accrued interest on June 30, 1879, to which date the last accounts were made up, amounted to 20,000*l.* I must even correct that statement. The accrued interest did not amount to nearly that sum at that date. But "X," not being able to make it appear that even fully 20,000*l.* is the equivalent of over 40,000*l.*, goes on to affirm that in 1877 the company capitalised some interest then due, by issuing some preference shares in payment of it. Of course they did, everybody knew that; but what has it to do with the question raised by "X," of the amount of interest now due on the preference shares of the company? The answer is, absolutely nothing whatever; and I think those of your readers who take any interest in the matter will perceive that, to say the least, it may be doubted whether the motive of "X." in writing has been that of promoting the interest of—

Feb. 17. A SHAREHOLDER.

GOLD MINING.

SIR,—Some few months ago I predicted gold mining would be the topic on the board in London, and the time I anticipated is fully realised. It appears gold mines are going to work all over the world. The Rio Grande do Sul Gold Mining Company are going to start some rich gold mines in the Brazils, and from what I can learn there are thousands of leagues of mining properties rich for gold and diamonds in the Brazils. I am glad to hear there has been a rich vein of gold cut in the Ouro Podre lode, Pitanqui, and also that Santa Barbara is so rich, about to make a thousand pounds profit this month. And it is also gratifying to learn that Don Pedro North del Rey Gold Mines have commenced to make profits, and it appears Don Pedro will soon be in its proper place, the Dividend List.

ANGLO-BRAZILIAN.

THE PANULCILLO COPPER COMPANY.

SIR,—The December report of Mr. Welch, dated Panulcillo, Dec. 24, has just been received, and is again of a very favourable nature. Against an estimated output of 36,000 quintals metrico, the actual amount raised was 41,000 quintals, the break in consequence of the Christmas holidays notwithstanding. The production in the last three months of 1879 has reached the high total of 132,000 quintals, against an estimated production of 108,000 quintals; increase, 24,000 quintals in three weeks. Mr. Welch also states at the end of his gratifying report that, with hands fairly abundant during the present half-year, the mine production promises a considerable improvement on the past few years. The conclusion is easily drawn, Panulcillo shares are likely to have an important rise very soon, more especially as the period is rapidly approaching in which it will be the pleasant duty of the directors to distribute amongst the shareholders a substantial interim dividend. The prospects of the copper market are remarkably good. Copper is still the cheapest metal, and likely to rise considerably in the spring, and this must of course have a very beneficial effect on all shares of copper mines. Even with present copper quotations—72*l.* to 73*l.* per ton—Panulcillo is making net profits at the rate of 30 to 35 per cent. per annum, and every further rise in Chili bars must naturally increase them in proportion. Considering that shares like Rio Tinto, which have no such dividend prospects, are actually at a high premium, the price of Panulcillo shares must strike everyone as being very moderate—in fact, ludicrously low. At 6*l.* I consider them the cheapest copper shares now in the market, and a rapid rise to 10*l.* is inevitable before 1880 is out.

CHILI BAR.

UTILISATION OF PETROLEUM RESIDUES.

SIR,—Now that it appears likely that we shall have Hanoverian as well as American petroleum in the market, the utilisation of the residues of the distillation of petroleum, ozokerite, and the like is of paramount importance. I may, therefore, direct attention to the invention of Dr. Greiff, of Munich, by which from these substances benzole, tolnole, xyloie, and their homologues are produced. Dr. Greiff either works continuously the crude petroleum or material, obtaining the burning and lubrication oils by known methods, and such as are employed on a very large scale in the United States of America, where the distillation and rectification of petroleum oil is mainly carried on, and then work the residual products; or he obtains the residual products from the distillers, rectifiers, or purifiers of those oils. He introduces the residual products into retorts, filled with charcoal, coke, metal, stone, or other suitable material, the object being to bring the vapours of the residue into contact with a large area of heated surface. He either uses one or a series of retorts similar to gas retorts filled with such materials, and then introduces the substances from which the hydrocarbons are to be generated either in a spray or when converted into vapours.

When converting in vapours, he vapourises the material in a separate vessel, and leads the vapours into the retort. The retort and its contents are heated to a temperature higher than that of the vapour, and yet not so high as to produce any large quantity of permanent illuminating gas. Some illuminating gas is, however, necessarily produced. The heat in the retort being so regulated as to ensure only a small but continuous generation of gas, which may be used either for lighting purposes or for heating the retort itself. The retorts are provided with suitable condensing apparatus for the tarry liquid which contains the said hydrocarbons, benzole, toluole, xylole, napthaline, anthracene, and the like. This tarry liquid is distilled in the known manner in which the coal tar oils are distilled. Hitherto the only source of supply of the hydrocarbons, benzole, toluole, xylole, napthaline, anthracene, and the like on a commercial scale has been the coal tar; but he produces them from petroleum, ozokerit, and other mineral oils, bitumens, and resins, which have hitherto not been rendered useful for that purpose.

P. J. H.

Hanover, Feb. 16.

CHEAP MINING SHARES—GLENROY.

SIR,—Those investors and speculators that have acted upon my advice in the matter of Panulcillo Copper, Copiapo, and other mining shares cannot, I venture to submit, reasonably complain as to the result. Since I directed special attention to them in these columns Panulcillos have advanced from 2 to 6½, Copiapos from 10*l.* to 17*l.* Albeit they have receded a little since, the reaction is unimportant, and it must, in my opinion, soon make room for higher prices.

To-day I would draw the attention of your readers to the shares in the Glenroy Lead Mining Company (Limited), which are quoted regularly in the Journal, and which I am convinced must ere long have a rise at least as important as that referred to above in Panulcillos and Copiapos. I have not failed to obtain, as I always do, authentic information before rushing into print, and the following can, therefore, be thoroughly relied upon as absolutely correct.

The Glenroy Mine is situated in the Isle of Man, and adjoins the famous Great Laxey. The 4*l.* shares of the latter company are held as an excellent investment, and find buyers at an enormous premium, the actual market price being about 19*l.* The Glenroy shares are likewise of 4*l.* each, fully paid, and these may still be bought at below 30s. per share—that is to say, at a discount of over 60 per cent.

If Glenroy were a concern without future and working capital, or crushed by debts, such an abnormal discount could, perhaps, be explained. But, as a matter of fact, Glenroy has still ample capital, and no debts. On Jan. 9, 1880, there remained a credit balance of over 5000*l.* It is, therefore, obvious that Glenroys should be at par even now, without at all taking into account the undoubtedly brilliant future of the property. But, with present prospects, I say these shares should be at a good premium, and they cannot fail to be so before long. The present nominal quotations—I doubt very much whether a larger number of shares could be bought at even 30s. per share—are absurd, and simply imply the fact that Glenroys have been overlooked and neglected. Their turn must, however, come bye-and-by, and those who have time to wait, may—in course of time—see prices which now seem fabulous. But in mines such "wonders" often occur, and the word "impossible" is unknown in the mining dictionary. What are the prospects of Glenroy? I say, without exaggerating, that this property has a very fair chance of becoming a second Great Laxey. I cannot, of course, think of quoting the reports of Mr. R. Rowe, the mining captain; but they have been regularly published in the Journal, and all who wish to secure an interest in the mine should carefully peruse them without delay. Those reports all point to one capital fact—with increasing depth Glenroy becomes richer and richer. And when the directors in their last report, submitted to the general meeting of shareholders on the 5th inst., say—"It is represented that in depth a very valuable lode may be looked for, and this view seems considerably confirmed by the richness of the adjoining Great Laxey Mine in the deeper levels," they simply state in guarded language what is no longer a matter of doubt for all practical mining engineers who know the geological formation of the Isle of Man, and are acquainted with Great Laxey. Some 20 or 30 fms. remain yet to be driven in Glenroy before the depth of Great Laxey is attained, A very short time will accomplish this, and there, it is very nearly certain, will be found the same rich lead which has sent Great Laxey shares up from 4*l.* to 20*l.*, and beyond.

A PERMANENT SHAREHOLDER.

Feb. 18.

NEW AND OLD MINES.

SIR,—The Journal gives evidence of the activity of sanguine promoters of new and old mines to be re-started or re-worked, some of which absorb all, or nearly all, the subscribed capital in forming the company, leaving nothing but a list of misled shareholders to continue the operations or abandon the adventure. It is more than probable the latter will be the fate of many schemes now starting, and that the water will never be forked nor the bottom of the mine seen before operations cease, For my part, few are the abandoned mines that I would join where any premium whatever is sought to be charged. The risk is sufficient if one subscribes money to be honestly devoted to the proving of the mine, without giving thousands of pounds to promoters whose fertile imaginations are only stimulated to misrepresentations with the prospect of filling their own pockets more quickly than the development of the mine would do.

I prefer the course adopted in Wheal Jewell, South Penstruthal, and North Penstruthal, where every subscribed penny is spent on the mine itself, and the shareholders see their property rise in price, as in North Penstruthal, which, with 10s. paid, are now eagerly sought after at 3*l.* per share, or 500 per cent. premium, and the greatest probability that they will soon be four times the price, by actual discoveries and increased returns of mineral. Surely here was a concern in which a premium might have been charged, seeing there had been expended on the development of the mine within ten years 70,000*l.* Fortunate are the shareholders of the old company who decided to persevere in the new, for not only will they recover money sunk, but good profits ere long. South Penstruthal shares are in demand, at 1*l.*, or cent. per cent. premium. A 60-inch engine will be forthwith erected here, for which an excellent engine-house is already built. As soon as the shaft is well secured cross-cuts will at once be started to intersect the boundary tin lode, which is so productive in the Comford Mine, and which runs entire through this mine. To the east of the Penstruthals is another large piece of ground, near whose western boundary is the junction of granite and killas, the lodes of which run through the whole length of the Penstruthals. This is virgin ground, and contains not only the said lodes, but also one or more of Wheal Buller lodes. The shares will be offered in due course to the old shareholders of Penstruthal Consols. Should they not subscribe for them, then the public will come in at 10s. per share, which will be expended in erecting an engine and prosecuting the mine vigorously. Under the present energetic efforts of the committee there is every probability of an early and great success. Herodsfoot is another mine bought for a nominal sum, offered for the same to the public, although the shares once were upwards of 40*l.* each. The mine had been worked with a view to its abandonment when bought by the present company. The mine, therefore, required opening up, shafts and levels securing, modern appliances for dressing the silver-lead ores, all of which have been done. A call of 5s. per share was made at the last meeting, with a view to erecting a steam-whim, as the water-power had not proved sufficient to draw to the surface half the lead ore the mine is capable of yielding. There is no lead mine in the United Kingdom whose produce gives so much silver, and whose prospects at the bottom of the mine, and above the 70 to the surface, warrant a great rise in price and the early prospect of dividends.

Without condemning any new scheme in which premiums are sought before a blow is struck, here are four instances of Cost-book companies brought out on the principle of "share and share alike," with a result of 75 to 100 per cent. profit to the shareholders, and even 300 and 500 per cent. profit has been obtained since January, 1879, every one of which seems destined to see a very much higher price—indeed, pounds instead of shillings.

North Herodsfoot is in 12,000 shares, and will be a most inexpensive mine to work, all the water being drained below the present depth—150 fathoms—by the Herodsfoot Mine. As soon as the drawing machinery is up returns of lead will be made. Shares are 12s. 6d. to 15s., and are all taken up by those who know the merits of the property, and the favourable conditions under which it can be worked. All the necessary buildings are erected, and it is expected the engine will be in and ready for work in two months. This investment can safely be recommended as of sterling merit. West Phœnix has been brought out in 12,000 shares, and 4000*l.* banked for the erection of machinery, dressing-floors, &c.; present price 2½, or 27,000*l.* for the property.

Tin shares have had a slight reaction, from tin receding 2*l.* per ton—this is but temporary. I anticipate tin will see a much higher price before the end of March. Shares will go correspondingly higher. There are, however, certain shares which the investor should not be induced to buy, and he should consult someone of experience before doing so. A good demand for shares in the following mines has continued during the week—Wheal Basset, East Pool, South Crofty, North Penstruthal, South Penstruthal, Herodsfoot, Phœnix United, North Herodsfoot, Wheal Agar, and Glenroy Lead Mine.

JOSEPH J. REYNOLDS.

THE GRIFFIN LODE—BETTWS-Y-COED.

SIR,—Will you allow me to ask through the Journal who really has the Griffin lode? As to who has it at the only part yet cut there cannot be a doubt, as it is in the possession of and being worked by the company who gave it its name—the Griffin Company. But what I want to know is this—When, having traversed their sett, it leaves it in a north-westerly direction, whose sett does it go into? I think this is an important point, and one which, when it is settled, must materially influence the relative values of the adjoining properties, and I cannot understand how, with so clearly defined and powerful a lode, the practical men in the neighbourhood can have any doubt. Surely the science of dialling is not at so low an ebb that there should be much question as to which sett should contain the continuation of a lode the bearing and underlie of which are so accurately known for so many fathoms as are now being worked by the Griffin Company. Really reliable information on this point should be a great guide in investing in shares in whichever adjoining mine receives the lode. The Griffin itself seems to have no shares on the market, and to be, as Messrs. Watson described it some time since, "almost a private company."

I am particularly incited to ask this just now by seeing in the Journal of Jan. 24 a statement in the annual report of Aberllyn that "the vendor has lately handed over to the company, free of charge, a valuable extension of sett on the run of the Griffin lodes." I am already interested in one mine in the district, and know something of the part, and thought the Griffin and Aberllyn setts joined without any intermediate ground, and as a constant reader of your Journal could not fail to notice how, ever since the Griffin started, Messrs. Watson Brothers have been building great hopes for Aberllyn on the positive fact that the Griffin lode ran straight into that sett. If I am correct, and the two properties join, and the lode passes from one right into the other, how has the vendor acquired any extension on the run of the lode, unless by purchase from the Griffin? I cannot imagine it has been thus obtained, or would it have been handed to Aberllyn "free of charge."

That the great Gorse lode (not yet being worked by the Griffin) runs through their property into Aberllyn sett is undoubted, but it cannot be this that Messrs. Watson have referred to, as I remember they wrote some months since that "the Griffin lode entered Aberllyn 17 fathoms west of the Gorse lode, and would be within 60 fathoms west of the Gorse lode at the middle adit level up the hill, and as a cross-cut had been driven 50 fms. or more by old men, evidently to cut this lode, four men had been put to drive this to intersect the Griffin" (or, as they then termed it, the Cwm Llanerch lode).

With "speculation in my eyes" I watched for the result of this, and gathered from the weekly reports in your Journal that, having been kept to it for about four months, these men were stopped without reaching the lode. I naturally inferred that the dialling must have been wrong, as there should only have been less than 10 fms. to drive, and I have since failed, although I have watched carefully, to see any proof adduced as to where this lode does go to. Will one of the able mining men of the district, before whom this will come, settle the point for a— —— HESITATING INVESTOR.

ALL ABOUT TIN.

SIR,—It is to be hoped that the many discoveries of gold in Tasmania recently made may prove lasting, or we shall hear of more tin from that colony. From the latest returns received the gold mines are becoming of very considerable importance, and drawing off much labour from the tin mines. Nevertheless, the following extract from the Launceston Examiner, recently received, shows the increasing importance of the tin mines in contradiction to the many misleading statements of falling off that have been made:—

"On the north-east coast the alluvial tin claims are being energetically worked, and during the month 280 tons of ore have been received at Launceston from that district. As a result of the increase in the price of tin several of the claims have been enabled to declare dividends. The Frome River Company has declared two dividends of 1s. and 1s. 6d. each respectively during the month, while the Pearce and Ruby Flat Company declared a second dividend of 5s. per share. From the Mount Bischoff Company's Mine 167 tons have been received, and 12 tons from the Don Company in the same district. The former company recently declared a dividend of 10s. per share. This makes the 14th dividend declared by this company, who have now paid 7*l*. 10s. per share, making a total of 90,000*l*. in dividends The yield of tin ore from this district is likely to be very much increased in a short time, as the North Bischoff Valley Company have completed the erection of their crushing and dressing machinery, and as there are several well defined lodes on their property the battery should be kept constantly crushing."

Taking this in connection with the reports we are daily receiving from Queensland, and from other parts of the world, we must see that there is no foundation for the wild statement that has recently been put forth by a pretended authority that we are likely very quickly to see the price of tin 20*l*. per ton higher. The price of tin is very good at present, and a steady price should now be the aim of business men. A steady price will now be better for capitalists and for general trade; while a great immediate rise, to be followed by a corresponding inevitable fall, would only be favourable to pretenders and tricksters, and should be sternly guarded against. The value of tin exported from Tasmania for the eleven months ending with November last was 260,796*l*.—*Redruth, Feb.* 12. W. TREGAY.

CORNISH MINING—THE GWENNAP DISTRICT, AND ITS UNWROUGHT GROUND.

SIR,—The importance and prosperity of the county are derived chiefly from the existence of minerals, and has proved a source of wealth to its people for several centuries. Many of its mines worked successfully for periods of 50 to 100 years, the most renowned in this district being the Great Consols United Mines and Ting Tang to the east of the Carn Marth granite range, Tresavean on its south, Wheal Buller and Penstruthal on its west, and Wheal Peevor, Great North Downs, and other mines on its north, whilst in their midst, and on the same veins, are cheap progressive mines, embodying all the elements essential to success, far more deserving attention than some represented by a market value of 100,000*l*. The intrinsic worth of such properties should be carefully studied, and when free from feverish speculation should be purchased, as upon pioneer points of operation becoming realised it is not an unusual occurrence for shares to advance from 1*l*. to 10*l*., and from 10*l*. to 50*l*., or from 50*l*. to 100*l*. in the course of a few months; as, for instance, those of the very group mentioned. Tresavean, with 32*l*. 10s. paid per 96th share, rose to 2700*l*. each, nor was the price much out of character, for it divided 800,000*l*. profit, or 250*l*. for every 1*l*. expended, while the aggregate profit on the others have exceeded over 3,000,000*l*. There are thousands of fathoms of unexplored ground within the circle of those rich mines, having the same productive lodes, now receiving that attention which is more than likely to lead to the discovery of vast mineral wealth, and enrich those who invest the comparatively small capital required for its development. It is this description of property that should be carefully studied, and the uninitiated would do well to employ the agency of practical authorities in their selection, which in the end will not prove second to those that enriched our forefathers, and added so greatly to the wealth and commerce of the country. CHARLES BAWDEN.

St. Day, Scorrier, Cornwall, Feb. 18.

MINING IN WHEAL CREBOR DISTRICT

SIR,—During my rambles in the past ten days I find the mining industry in the east part of Cornwall and west of Devon to be rising from its late lethargy and slumber; great activity is manifested in different parts, particularly in the neighbourhood of Tavistock and Calstock, &c.; the latter seems to be taking the lead. The new north lodes at Hingston Down Consols lately discovered by the adit level already opened are some 10 fms. in length, where some very rich copper ore is met with, producing 37 per cent. of fine copper, which is likely to lead to good and profitable results. A new engine-shaft is in course of sinking for its proper development. The managing agent on the mine is highly pleased with its appearance, and speaks in the strongest terms of its ultimate success. Gunnislake (Clitters), to the east of this discovery, supposed to be on the same lode, with its fine course of ore going down in the bottom of 224 fms. deep; but the principal excitement appears to be in restoring the most eligible piece of mining property in the vicinity by an influential company adjoining the Devon Great Consols west, which is now called the West Devon Great Consol, on the same productive lodes. There are other mines to the east of great promise—to wit, the old Wheal Crebor, with its fine courses of ore at the 120 and 108 fm. levels, in the most eastern points leading into the adjoining mine, East Wheal Crebor and South Wheal Crebor embracing the parallel lodes of good promise; at the same time several other young mines which will claim attention in the future. TOURIST.

Feb. 19.

EAST PEEVOR.

SIR,—Whenever and wherever there is a rich discovery in a mine—as at Wheal Peevor—other mines are sure to be started with relative names, in some cases to mislead investors as to the position of the mine, and because there is something in a name. Hence we have West Peevor, New Peevor, and East Peevor; and I expect to see other Peevors—such as Great Peevor, Peevor Consols, South Peevor, Peevor United, Peevor Amalgamated, &c. I would not for a moment suppose that the promoters of the Peevors have any bad intentions. I will accept those mines as good things—especially, of course, West Peevor. As to East Peevor I am not so confident; I know that there is tin there, but whether sufficient to remunerate speculators is a question which can only be solved by exploration. As to the identity of the lodes there with those of Wheal Peevor, which some persons assert, I deny. The strike of Peevor lodes is southward of the lodes in East Peevor; but I do not think the worse of East Peevor on that account, because rich lodes rarely continue rich for a great distance, such as that of East Peevor, which is about two miles eastward of Peevor. It is not certain that Peevor lodes extend so far; lodes are not illimitable.

As to the impropriety, which one of your correspondents allege, of naming a mine two miles distant from Wheal Peevor "East Peevor," there is nothing new in that, for West Poldice, in Lelant (which I surveyed in 1833), is nearly 15 miles west of Poldice, in Gwennap; and West Tresavean, in Camborne, is several miles west of Tresavean, in Gwennap; and South Tresavean is about four miles south of that rich mine. I understand that the promoters of Great North Downs intend to name that mine "East Peevor," and that they were annoyed at having that name applied to another mine

East Peevor embraces parts of the late Scorrier Consols and East Treskerby setts, and an old mine, which (when I surveyed the land in 1831) was called the Gomps Mine; but it is only slightly worked. East Peevor may be a fair speculation, but does not, in my opinion, warrant the payment of purchase-money for the mine. A company taking up the "concern" should pay only working cost, and the cost of the title deed. There is no discovery to warrant a premium.

Truro, Feb. 18. —— R. SYMONS.

THE COLLACOMBE MINE.

SIR,—I am very glad as an old shareholder to see that the Collacombe Mine is going to be pumped out and set to work again, as such a mine should not have been allowed to stop working. I do not like the new name. It should have been the East Devon Great Consols Copper and Blende Company. —— MINER.

THE TOLLDISH MINE—PARK OF MINES.

SIR,—I am informed that it is proposed to start Tolldish Mine, near the Indian Queens, which is very rich in tin. Operations were suspended three or four years ago, owing to the very low price of the produce. Captain W. H. Bullock, of the Indian Queens, is to be the agent. The working of this mine, the Park of Mines, at the west, the Great Perran iron mine at the north and east, and Wheal Edith iron mine at the south-west, will afford considerable employment to the mining population in the district, which is much needed. It is a pity that the owner of Park of Mines does not sell the property to some one or more person or persons who could supply funds to work the mine in an effectual and miner-like manner. There is no question as to its richness, but the present plant is not adequate for the proper development of the mine. The tinstone raised here was wonderfully rich. This mine and Tolldish Mine will s upply an enormous quantity of tin when properly opened. A MINER.

Feb. 19.

GREAT NORTH DOWNS AND PENDARVES UNITED MINES.

SIR,—It is not my province, and, therefore, not my habit, to criticise other people's schemes, or to meddle in other people's business, either anonymously or otherwise, consequently I am not going to do so now. I write to ask you if your correspondent, "Pro Bono Publico," is not in error when he says that "Great North Downs was worked lastly under the management of Capt. Joseph Vivian?" I think that I remember perfectly well the last working of Great North Downs, and believe that Capt. Rich was the last manager there. It is sometimes unwise to criticise a mining or any other scheme without knowing all about it, and it is pretty clear that "Pro Bono Publico" or myself is in that position—perhaps both are. It has been said of Prof. Pepper that he detected a millionth part of a grain of metal in a sunbeam. If that be so there must have been lines in the spectrum which ordinary eyes could not see. May there not he lines in the spectrum here which ordinary eyes have not detected?—*Redruth, Feb.* 18. —— W. TREGAY.

CWM DWYFOR MINES.

SIR,—My attention has been directed to the letter which appears in the Supplement to to-day's Journal signed by a "Small Shareholder," in which the writer tries to cast a slur on three agents for spending the shareholders' money in erecting expensive machinery instead of bringing up the deep adit. Query—Was the agent then in charge at fault, or one of the directors? and I think in justice to the other two agents the names of the agents should have been stated, as four Cornish agents have from time to time had the management. But as the last manager of these mines I beg to state all the expensive machinery on the mines were erected long before I became acquainted with the company or even knew of its existence, and I can say the same for my friend Capt. Morcom; but a crushing mill was erected by me. Even this was ordered, and almost in a finished state at the foundry, before Capt. Morcom's or my time.

I also enclose copy of a letter I have to-day sent to the secretary, and as I leave on Monday next to explore some gold works in Dutch Guiana, if you will kindly insert this with the other letter to the company's secretary in next week's Journal I shall be obliged.

Stoke Newington, Feb. 14. JOSEPH JEWELL.

DEAR SIR,—In reply to yours I beg to state that I consider you have as good a chance of success at Cwm Dwyfor as they have at Symdde Dylluan; and for convenience and economy of working I would certainly prefer Cwm Dwyfor, as by extending the adit the lodes will be cut at a good depth, and no lifting or pumping will be required. I should strongly advise you, however, to carry out the work at Morgan's shaft on the Brynarian property by driving the level at the 20 for a few fathoms if it is still in your hands. I have had lumps of splended lead ore from 40 to 70 lbs. in weight broken from this part of the property.

There is also another point in that property worthy of completion—the driving of the boundary adit another 20 fms., so as to get under the old Brynarian workings, where the lode was several feet wide. I am very sorry that I shall not be able to attend the meeting on Wednesday next, as I leave on Monday for Dutch Guiana.

All mining is so much better now that it would be a pity to let the properties go into other hands without making an effort to save them.

G. J. Gray, Esq. —— JOSEPH JEWELL.

THE DISTRICT ROUND WEST CHIVERTON.

SIR,—"Pro Bono Publico," in his letter in last week's Journal, has, inadvertently no doubt, made a rather too sweeping assertion when he gave his "instances" of mines of "no value whatever" surrounding one particularly successful. Now, although he is right in the broad statement that often around a good mine we find many unsuccessful ones, and that it is a folly to reopen deep mines, unless they can be worked on more favourable terms than they formerly were, particularly when there are plenty of shallow mines awaiting development. yet I hope he will allow me to say that he has rather written unguardedly when he instanced West Chiverton as the centre "of a group of mines of no value whatever." Here he is in error. The fact is, West Chiverton is the centre of a group of mines as valuable as any in the kingdom, but the great bulk of them have not been profitable to the shareholders, and why? Not because they lacked wealth, but because the shareholders lacked the backbone of success—perseverance. And, I may add, the principle on which they were worked. Limited Company has been proved time after time as a system not for proving the value of a mine so much as the honesty or otherwise of promoters and management. Moreover, when West Chiverton proved so great a prize up started companies in every point of the compass around it, irrespective of lode, geological formation, or zone, and each body of shareholders joined them, hoping to attain in months what West Chiverton only attained in years. To be sure they could not do it, and so, becoming disappointed, threw up their interests, thinking no doubt that the various sets were worthless. Some of them no doubt were, but many of them are valuable, even if profitless to the late shareholders.

One striking exception to want of perseverance, and at the same time showing the value of Cost Book over Limited Company in progressive mining, is found in the district above named, and that is East Chiverton, a shallow mine, the meeting report of which appears in the same Journal as "Pro Bono Publico's" letter, and which report must be very satisfactory to the shareholders. Here we have an instance of the perseverance required by mine adventurers, in this case no doubt engendered by the fact of having—1. A good sett, the same lode, the same country rock, the same mineral zone, and adjacent to West Chiverton.—2. Being conducted on Cost-Book Principles.—3. Having a good manager and honest management. So far as myself is concerned, it has been the knowledge of the above facts that caused me to continue my connection with the mine as a shareholder uninterruptedly during the last 11 years, and without doubt shall now, with the present prospects of both the mine and mineral market, be rewarded for my patience. I shall, of course, accept my full share of the forfeited shares that are to be given to the present shareholders. I say given advisedly, as the nominal sum to be charged to us for them is to be expended on a winding-engine, so as to enable us to return lead in sufficient quantity to make profits. When we get the engine we shall be provided with engine power, &c. (we have already one of the best pumping-engines and pitwork in Cornwall), to work between the two points, the 99 and 150, at which West Chiverton gave its wealth, and which points we are now entering on, and no doubt should "Pro Bono Publico" next year require an instance of persevering legitimate and successful mining he will select

—— EAST CHIVERTON.

THE DEVON COPPER AND BLENDE MINING COMPANY

SIR,—I have been asked by the secretary of the above company to take some shares, and induce my friends to do likewise. Now, it appears to me, as also to some of my friends, that provided all is true that is stated in the prospectus the secretary will not have long to wait for subscribers. I know, as one formerly connected with the mine, that all very much regretted the stoppage of the works, but the engine and machinery were not powerful enough, and another thing, the Devon Great Consols Mine just then had quite enough on hand with their own property, as the marketable value of their shares was about 800,000*l*., on an outlay of only about 104*l*. There is no doubt that a large quantity of blende was broken and thrown back into the mine, as blende at that time was hardly worth bringing to the surface, and to prove this fact a friend of mine sold over 1000*l*. worth of ore by simply picking over an old heap on the surface of the mine since the engine burst and stoppage. A SHAREHOLDER

Forest Hill, London, Feb. 12.

EAST ROMAN GRAVELS.

SIR,—With reference to your correspondent in last week's Journal I would remark that it has repeatedly been noticed in your columns that the above is the right name for the mine, instead of West Tankerville (its former name). Roman Gravels and East Roman Gravels are quite close to each other, some of the levels being driven from one into the other. The mine is being worked not for the market but for profitable results, and I am happy to say that the progress made is most satisfactory.—*Feb.* 18. A SHAREHOLDER.

NEW BRONFLOYD MINE.

SIR,—In reference to my letter in last week's Journal permit me to state that in calling attention to this valuable property as one of the neglected securities, and likely to become one of the greatest lead mining properties in South Wales, two errors have occurred—that there are only 4678 shares issued, with 4*l*. 17s. paid, and not 5300, by mistake put down by me; and that lead was quoted at just 28*l*. per ton, and not 23*l*. in America, which also is a mistake. These two facts make it much more favourable for New Blonfloyd Mine.

—— MINING ENGINEER.

THE DEVON COPPER AND BLENDE MINING COMPANY.

SIR,—Numerous complaints and enquiries have been made to me, as secretary of the Devon Copper and Blende Mining Company (Limited), concerning the clause which appears in the prospectus of the company to the effect that if no shares are allotted the money paid for shares will be returned, less the expenses incurred in the formation of the company.

I would ask you to allow me to state through the medium of your valuable paper that this clause was inadvertently inserted in the prospectus, and that if no allotment is made the whole of the money paid will be returned. W. BAWDEN SKEWIS,

Secretary of the Devon Copper and Blende Mining Company.

WEST DEVON GREAT CONSOLS.

SIR,—Can you tell your subscribers how they can get any shares in this new mine (the West Devon Great Consols), as no one seems to know anything about the company? I have received a prospectus of the Devon Copper and Blende Company, which seems a proved property, so far as blende is concerned. I am told there are thousands of tons in the mine already to bring to surface when the water is pumped out. Allow me to suggest that this company take advantage of the new process for the economic treatment of blende, patented by Messrs. Wegelin, Hübner, and Pollacsok, of Halle-on-the-Saale, Germany.—*Plymouth, Feb.* 18. —— F.R.G.S.

WEST DEVON GREAT CONSOLS.

SIR,—A few years ago this mine was reported by many eminent mining authorities as the one that could not fail to become as rich as its neighbour Devon Great Consols, therefore we are pleased to observe that the property is being reworked by an influential London company, who believe that a great success will attend their efforts. Some of the rich lodes now worked upon in the Devon Great Consols pass directly through the sett, it being divided only by the River Tamar. The copper and mundic now being raised in each of these mines have the same appearance and character. Capt. James Richards, the late manager of Devon Great Consols, was also manager of the West Devon Consols property, and his opinion of the ultimate richness and value of the lodes is still on record. Capt. John Lean, also an expert of great authority in mining, recommended by Mr. Robert Hunt, of the Royal School of Mines to inspect the mine, gave an exhaustive report, declaring it to be a most valuable piece of ground, and estimates that the lode will become very remunerative if properly developed. Surrounded with every element of success as the West Devon Great Consols undoubtedly is, having such rich neighbours as the Devon Great Consols on the one side and Gunnislake Clitters on the other, both of which mines will soon resume dividends, it is refreshing to see such a legitimate enterprise as this started with so much vigour after years of mining depression, and we sincerely wish the adventurers a speedy success. TRADESMAN.

Tavistock, Feb. 18.

MINING IN LLANARMON.

SIR,—I have to congratulate your correspondent "Enquirer" on his amalgamation scheme in this district, for had it been carried out 30 years ago there is no doubt that this district would now have been recorded as the greatest lead ore producer in Great Britain. The key to this immense wealth is the Great Nant Adda deep level, which has already been driven 700 yards, and if continued eastward and cross-cut to the north and south lodes it would not only cut the numerous runs of ore known to exist, tap the main feeds of water and save thousands in pumping, but the lodes could then be developed to a great depth below the adit level. As nearly all the details are completed it only remains for capitalists and investors to give it their support, and then a sett of mines unparalled will be the result.

JOHN L. M. FRASER, Consulting Mining Engineer.

Wrexham, Feb. 20.

PARYS COPPER ASSOCIATION MINE OF ANGLESEA.

SIR,—If we may judge from the good accounts of this mine which have from time to time appeared in the Journal, it has, if properly conducted, a brilliant future. I bought some shares in it awhile ago at 10s., and they are now worth three times that amount. It must, however, be a matter for especial regret to the original 2*l*. shareholders that no tunnel is driven into the heart of Parys Mountain to develope the hidden riches supposed to be there in the shape of an enormous deposit of copper ore. If we may judge by reports in the *Mining Journal* a few miners work weekly at the mine with pick and shovel. Occasionally parcels of ore are sold at good prices, and no reports, or very few, are issued to the shareholders. The office of the company is in London; the secretary resides there, and I fancy the directors also. If the large shareholders wish to realise the riches of their property they would do well to have it developed in an energetic and workman-like manner, and insist that their directors and secretary reside near their work, and visit the mine several times weekly. Were the Parys Copper an American mine, long ago a tunnel would have been driven into the mountain; the existing reserves of copper ore (a large quantity) smelted and sold, now that copper is at a good price; and mining operations vigorously and energetically pushed forward.

Large shareholders should remember that Parys Copper was about a year ago in such difficulties that it was virtually wound up, and the present company arose on the ashes of the late one. I predict if the present company do not act with vigour, energy, and determina-

tion it will share the fate of the former. he 30s. shares ought to be worth 100*l.* each if the company do their work properly. I have for many years superintended large public works, but invariably found it desirable to live close to them. Let the large shareholders of this company take my hints and look after their property.

Judging from the report of the mine published in the Journal of last week a few miners are at work, there ought to be ten times that number, and rock-boring machinery ought to be at work.

——— LOOKER-ON.

MINING IN CARDIGANSHIRE.

SIR,—I quite concur with the remarks of your correspondents "Observer" and "J. H. L." as to the relatively low price of lead shares in comparison with those of copper and tin. Since the beginning of the year lead mines have been somewhat neglected, and consequently the shares of some very fine properties are quoted far below their true value. As one of your correspondents justly observes, lead mines are the safest investment of the mining world, and ere long must receive the attention of the investing public, which at present low prices they will handsomely repay.

The lead-bearing district of the counties of Cardiganshire and Montgomeryshire embraces an area of more than 30 miles, ranging in a N.N.W. and S.S.E. direction. The stratification is clay-slate and silicious gritstone, in which are embedded the galena and blende lodes, having as a rule an east and west bearing. There are several mineral bearing rocks in Cardiganshire, in one of which we find such mines as Goginan, Bwlch United, Darren, Cwm Erfin, &c. It would appear that the country is composed of a succession of rolls or undulations in the same series of beds, which vary much in character, and the most productive lodes are situated in a definite direction or strike—east and west.

As an instance of the low price of lead shares in addition to those already named by your contributors take Bwlch United, which, though nominally standing at a premium, virtnally simply stand at par, because the present company inherited great advantages from its predecessors. Situated on the champion lode of the county, and immediately adjoining a property which has given great returns, it must soon come to the front, and assume its proper position in the market. Possessed of ample capital and a full field of machinery, with propinguity of payment of dividend, it is, in my opinion, well worth the prompt attention of investors. The sinking of the shaft is in full vigour, and an important discovery will be looked forward to, since from this point and at least 60 fms. deeper very large returns of ore were made from the adjacent mine; and as the three known lodes in the Bwlch will soon form a junction great results may be anticipated.

The columns of your valuable Journal clearly indicate that the present neglect of lead mines is passing away, for we read that such mines as Cwm Erfin, Powell, and Llwynmalees are soon to be brought to public notice. The last named is, I believe, at once to emerge from its ill-deserved stagnation, under management which will command the confidence of investors and augur well for a lasting success. ——— SHAREHOLDER.

CARDIGANSHIRE—MINING PROSPECTS FOR 1880.

SIR,—Feeling convinced that a little gratuitous information respecting the mines of this county, giving their present prospects, and what may, in all human foresight, be expected from them during the present year, without going into a detailed statement of each, will be acceptable, I have very great pleasure in being able to state the following, which will be found very close to the truth, and will throw some considerable light to all shareholders interested in the following mines. And commencing with the southern district, I will first mention Caron, where a good deal of money has been expended, and good ore discovered—I should say in sufficient quantities to pay two-thirds of its fair working expenses, and at the end of the year should be brought into a state of profits. The portion of the Lisburne Mines retained by Messrs. Taylor and Sons, with present prices of lead ore, will continue to pay dividends much as for many years past. Grogwinion will pay at present prices 5000*l.* per year in profits. Red Rock will meet expenses. Frongoch will enter the Dividend List, and will give from 6000*l.* to 8000*l.* profits this year. De Broke can pay its way if worked; it is on the Frongoch lode, and is a good trial. Cwmystwith should again, from present prospects, enter the Dividend List, and pay from 2000*l.* to 3000*l.* profit this year. West Esgair Lle will leave a slight profit on the present price of blende. The Temple Mine should give some small profit in 1880, and make a dividend. Powell United can be profitably worked at present prices for lead, and it is a pity for all connected with it that it should so long have remained idle. Tyn-y-Fron only wants a good water-wheel, crusher, and dressing apparatus to make it pay 4000*l.* per year profit. Goginan is being worked on a tribute of about 7*l.* per ton by 20 miners, and, as the ore is now worth 17*l.*, should give good profits. Bwlch United will get into a state of returns and, it is hoped, profits before the year closes. South Darren is an excellent mine, and should give 5000*l.* profit this year. New Bronfloyd should make good profits from the ore ground discovered. East Darren will continue its usual dividends. Mynydd Gorddu will about make the two ends meet. Cam Dwr Mawr has made great discoveries of rich silver-lead ore, and only wants proper machinery to make profits of 4000*l.* per year. The Cambrian are erecting a steam-engine, which will enable them to work their ore ground continuously, and as they have opened a very large piece of copper ground, worth from 50*l.* to 80*l.* per fathom, which can be taken away very cheaply, I do not see what can possibly prevent them from giving good dividends this year. The South Cambrian will have their machinery erected by the beginning of May, and will give good profits, and I expect a good dividend in 1880. But the Cwm Pryf Mines will be the first in the county to enter the Dividend List, and from present appearance will long continue in it, with increased prospects of success from year to year. It was only in July last that this mine was started, and in July next a substantial dividend will have been fairly earned from opening out the mine. The machinery, which will be driven by the River Rheidol, will all be started on March 17, and sales of ore will commence in May, from which large profits will be derived monthly. The engine-shaft being sunk to the 20 fm. level, and a communication made from it to the deep adit level, it is estimated that 35,000*l.* worth of ore can be laid open here in less than 12 months by boring machinery. It not only possesses these advantages, but much greater, as the engine-shaft has been sunk to the 30 fm. level, whence levels east and west may be pressed on, and, as the ore is found richer and more solid in depth, there is every probability that before the engine-shaft is deepened much further not less than 50,000*l.* worth of very profitable ore ground will be made available for profitable working. Since the opening out of old Goginan no mine in this county has been opened out so quickly with such good results. Cwm Pryf Mine (Limited) is in 25,000 shares of 1*l.* each, but only 20,000 of these are issued, 5000 remaining unissued. ABSALOM FRANCIS.

Aberystwith, Feb. 17.

CONSTRUCTION OF LARGE TUNNEL SHAFTS.—It is not an unfrequent cause of complaint that the young engineer, although possessing some scientific and some practical knowledge, is so utterly unable to connect them that both are useless to him. It is for facilitating this combination that such works as the practical and theoretical essay on the Construction of Large Tunnel Shafts (London: Crosby Lockwood and Co., Stationers' Hall-court), by Mr. J. H. Watson Buck, M.I.C.E., the resident engineer of the London and North-Western Railway, are of the utmost value. Mr. Buck gives details which will enable the practical man to work every stone for the base of a large shaft, by means of templates, above ground, thus ensuring accuracy of workmanship and considerable saving of time and money, combined with increased safety to the workmen. The chapters treat of descriptive geometry applicable to first principles; the leading dimensions obtained by calculation; the development of the intrados and extrados, &c.—plan, cross-section, and longitudinal section; the method of working the side beds and soffits, the backs, and the faces of the voussoirs; the method of working the top beds of the voussoirs by means of full sized plans with rules for drawing the same; the form, dimensions, and method of working skewbacks on vertical side walls; method of setting out the spirals and voussoirs upon the laggings; observations with reference to form of arch, &c.; and rules for ordering the stone. The details are carefully and concisely given in language which will be readily understood by all who will study the work, and the illustrations are ample. The information given will, if applied with ordinary care, relieve the practical man of much of the annoyance to which he is now subject by enabling him to get his work accurately done at first instead of blundering on until it comes nearly right by accident.

COAL CUTTING MACHINERY.—The improvements of Mr. W. C. CARR, of Newcastle-on-Tyne, consist in arranging or setting in succession in a suitable frame or holder a series of drills, chisels, or boring tools for the purpose of producing a cut more or less continuous or clean in the coal or mineral attacked. The drills or tools may be driven by hand or other available power, and with either a continuous or an intermittent rotary or reciprocating motion, and they are at the same time moved gradually forward. The various drills may be worked either singly, alternately, or in sets of any number as the conditions of the coal or mineral operated upon may require, and either horizontally, vertically, or at any angle. The continuous intermittent rotary or reciprocating and forward motions may be obtained in various ways; one convenient way is by the use of mechanism similar to that in a ratchet brace, the forward motion being supplied by the same power as that used for working the drills.

REPORT FROM CORNWALL.

Feb. 19.—There has been no special feature of note in the condition of mining affairs during the past week. The market has shown itself, on the whole, very sensitive to fluctuations in the metropolitan metal market, though in the case of some stocks special circumstances have had a largely preponderating influence. The present seems to us a time when holders of shares in good mines should exercise considerable caution. The probabilities are that, unless there is a very unexpected move in the standards, the effect of the next account in several leading mines will be to give them a very remarkable advance. Holders should, therefore, be wary.

So many new mines are being started, and the operations at others are being so largely extended, that it does not seem as if we were far off from a dearth of hands. Already not only are wages advancing all round, but really skilled miners may be said to be at a premium. Good men are decidedly scarce.

The wealthiest Cornishman whom the present generation has known died on Monday last at his residence, Pengreep, near Redruth, after an illness that had shown itself chiefly in gradual decline of health extending over several months, but which almost to the last enabled him to give his personal attention to his leading business concerns. What the wealth of Mr. John Michael Williams, for he it is whom Cornwall has lost, really is is not publicly known, but rumour puts his capital at little short of 4,000,000*l.* and his income at nearly 80,000*l.*; and when we discount this in the most liberal fashion there still remains the probability that his income did not fall short of 50,000*l.*, of which nearly 20,000*l.* is known to have been derived from his large landed estates in Cornwall and Devon. His principal seat was the palatial residence of Caerhayes Castle, so long the property of the ancient family of Trevanion. However, Mr. John Michael Williams claims to respect had a much better foundation than the fact of his being a millionaire. He was in every way a model man of business—shrewd, conscientious, diligent, persevering, and as simple and unaffected in his manners as if he had had in very earnest to work hard for a living. He had an excellent start in life, and he made the best or it; and if he was proud of anything it was of his business relations and capacities.

Mr. John Michael Williams was the eldest son of the late Mr. Michael Williams, so long the valued M.P. for West Cornwall, his brothers being Mr. Michael Henry Williams, of Tredrea, and Mr. George Williams, of Scorrier. He was born at Trevince, Gwennap, Dec. 20, 1813, and was consequently in his 67th year. He was educated at Blundell's School, Tiverton, and the Charterhouse. Succeeding his father in 1858, he had been for many years the sole representative of the firm of Williams, Foster, and Co., the great copper smelters, Swansea, with the head office at Barncoose, Gwennap, and other offices at London, Liverpool, Manchester, and Birmingham. Mr. Williams was also sole proprietor of the West Cornwall Bank at Redruth, and was formerly a partner in the Cornish Bank, but withdrew from that undertaking about ten years ago. At one time he was also largely interested in Cornish mines as an adventurer, but of late years took a desponding view of the situation, and had ceased to be a shareholder for some time. It is singular that a man so generally of such accurate foresight in all business matters should in this important particular have failed to recognise the actual position of the mining interest. He made, however, very few such errors. It was said of him, and truly, that Midas like whatever he touched turned to gold, and he combined so much good fortune with such careful observation and business aptitude that his name in connection with an undertaking was accepted by many people as a charm to success. He was known as one of the shrewdest and most cautious of men in all business transactions, and he used to pride himself on the training in careful attention to detail and business exactitude which he received when a mere lad from his uncle, the late Mr. John Williams, of Burncoose, who was a member of the Society of Friends, and possessed all the characteristics associated with that body. So much a man of business was Mr. J. M. Williams that he never took a prominent personal part in public affairs, though always feeling in them the liveliest interest. He might had he chosen have suceeded to his father's position of Member for the Western Division with the greatest ease; but though an ardent and advanced Liberal, and rendering the Liberal cause many weighty and important services, he was never ambitious of parliamentary honours for himself. He was an active and excellent magistrate, and a Deputy Lieutenant of Cornwall and a Deputy Warden of the Stannaries, and served as High Sheriff in 1865. Beyond this, however, he did not come prominently before the public. Until his late illness Mr. Williams chiefly occupied his time with his smelting and banking businesses, but his failing health had prevented him going into Redruth since the early part of last May. While ill he gradually contracted the circle of business affairs requiring his personal attention, and with that precision and forethought which characterised all his dealings had placed all his affairs in order against the inevitable day. He retained consciousness to the last, and did not suffer much pain. Mr. Williams married in 1852 Elizabeth Maria, eldest daughter of the late Mr. Stephen Davey, and niece of Mr. Richard Davey, of Bochym, who represented West Cornwall for many years. He leaves two sons and four daughters. The eldest son, Mr. Michael Williams, was born in 1857, and obtained a first-class last year in the Cambridge B.A. examination; the second son, Mr. John Charles Williams, is about 19 years of age. Both have been trained in business habits, and have been engaged in the office at Liverpool. Of the daughters three are unmarried; the eldest is the relict of the late Mr. J. B. Bolitho, who was a candidate for the representation of St. Ives in the last Parliament. The characteristic of Mr. Williams's thoroughly pronounced Liberalism that he should not have entailed any of his estates, and that he should have made arrangements for carrying on his banking and smelting, and other business engagements, by his representatives as during his lifetime.

There has been a prosecution in the "Far West" under the Metalliferous Mines Act, Mr. R. Boyns and Mr. J. B. Coulson being summoned at the West Penwith Petty Sessions for neglecting to put a signal apparatus to the man-engine of Levant Mine, as required by the Metalliferous Mines Act. Mr. R. M. Paull, of Truro, appeared for the prosecution. Dr. Foster proved that twelve months ago he ordered the signal apparatus to be erected, but when he visited the mine a short time since he found it had only then been commenced. —Mr. Coulson and Mr. Boyns, who are members of the Levant committee, complained that they should have been summoned, and stated that they knew nothing whatever of the matter, as it was never brought before the committee in any form; if it had been the work would have been carried out long ago.—Dr. Foster explained that he gave notice to Mr. White, secretary to the mine, whose duty it was to communicate the matter to the committee. The committee of every mine ought to know what was required under the Act.—The Bench acquitted defendants of any personal desire to neglect carrying out the provisions of the Act, but inasmuch as the law had not been obeyed they felt there was no alternative for them but to inflict a fine of 3*l.* and costs.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 19.—Those pig-iron makers who have comparatively recently blown in furnaces are not so strong in their quotations this week as some of the others who are well booked forward. In part-mine pigs there was yesterday and to-day in actual transactions a difference arising out of this cause of as much as 7*s.* 6d. per ton in some cases; medium pigs were 3*l.* 10*s.* All-mine sorts display no yielding, and the price remains at 4*l.* 10*s.* to 4*l.* 15*s.* A large demand for this description is coming from South Wales, where it is being delivered at 5*l.* per ton. Hematites are immovable at 6*l.* to 7*l.*, and Tredegar best pigs at 7*l.* These high prices prohibit business. The finished iron makers are full of work, as a rule, but the marked iron houses are not making full time. Buyers of branded iron are less willing to purchase than are those of medium and common iron. Prices are based upon 9*l.* for marked bars. Plates are officially 10*l.* 10*s.* to 13*l.*, and angles 9*l.* 10*s.* to 12*l.* Sheets (singles) are quoted at 11*l.* 10*s.*, but some makers will sell for 11*l.* The state of the coal trade is without alteration upon the week.

The Mines Drainage Commissioners are, now that their financial prospects are improved, giving increased attention to the carrying out of surface drainage works. At a meeting a few days ago the Chairman announced that surface works which had long been lying in abeyance were now about to be completed. The Commissioners at a special meeting a few days since levied a general drainage rate upon all occupiers of mines in the drainage area for the half-year ending December 31 of 1d. per ton upon all minerals raised.

The miners' agents representing the South Staffordshire and East Worcestershire districts have issued a joint appeal, urging the colliers to co-operate in an effort to secure an alteration in the sliding scale which regulates wages. It is desired that wages shall advance 4d. instead of 3d. with every 1*s.* per ton rise in coal. The men are advised to prepare to give notice for a termination of the present scale. The agents of the Cannock Chase miners have given the requisite six months' notice to terminate the agreement.

At a meeting of John Bagnall and Sons (Limited), held at Birmingham yesterday, the report, showing a net profit upon the year's trading of 2204*l.*, was adopted. The Chairman (Mr. Edward Gem) said the concern was in a much better position than six months since. The company had received 40,947*l.* from the Investigation Committee, and with regard to the claim against Mr. Albert Grant of 65,150*l.*, they did not know how soon they could realise.

On the Exchange in Wolverhampton yesterday it was made known that the management of the Claridge Iron Company (Limited) has again devolved upon Mr. Thomas Claridge, who is assisted in the moulding deparment by his brother, Mr. George Claridge, who also was one of the original proprietors.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Feb. 18.—A dinner was given to the workmen of the Plas-Power Colliery, near Wrexham, last week, and the owners and officials, with their friends, dined together, to celebrate the completion of the works at this new colliery. Mr. Henry Robertson, M.P. for Shrewsbury, the principal owner, presided, and occasion was taken for some happy and pointed speeches. Mr. Robertson and Mr. Darby, of the Brymbo Works, contrasted the present condition of the North Wales coal trade with that which many of us can remember before —owing chiefly to the energy of Mr. Robertson—railways had penetrated the district; when Chester was the principal coal market and coal had to be carted thither, and when it took two days to cart a ton of iron from the Brymbo Ironworks to the little port of Queensferry. Now the output of coal in the district reaches nearly 700,000 tons a year, and Brymbo coal is sent to California. The construction of that portion of the Great Western Railway which extends from Chester to Wrexham, with branches to Minera and Brymbo first known as the North Wales Mineral Railway, in the year 1845, commenced a new era in the development of the mineral resources of the district. The Plas Power Colliery is intended to work a large area of virgin ground. It is protected by well-known faults from the water which troubles surrounding collieries. The works have been carried out under the superintendence of Mr. R. N. Griffith, F.G.S., of Wrexham, an engineer rising into eminence. There are two shafts—one, the downcast, 16 ft. in diameter, and the other, the upcast, 14 ft. in diameter. The pit-heads are of iron, substantial and lofty. Six tubs of coal are brought up at a time, and the plant is equal to an output of 1000 tons a day. The shafts are sunk 270 yards deep to the Main coal, and the upper half of each is tubbed with iron plating until the solid rock is reached.

The recent references to the Llanarmon district as a field for lead mining seems to point to two or three conclusions—1. That high prices should not be paid for mining setts.—2. That the management should be of a very economical character.—3. That operations should be directed towards the eastern border of the limestone with its overlying sandstones, the runs of ore being more continuous, and the flats occurring in that direction.—4. The district is neither large enough nor rich enough to justify stock jobbing operations, but it is of a character to justify honest, intelligent, economical mining.

There is a little area in the north-east corner of Montgomeryshire, around the village of Llangynog, where lead mining has languished of late. The Cwm Orog Mine has stopped, and neither the old or the new Llangynog are doing much at present. Another mine, the Nant-y-blaidd, has been shut up a long time, nor have the slate quarries done much since they changed hands a year or so ago.

Yet the mineral wealth of the little district is undoubted, and its development suffers greatly from the absence of a railway, with the consequent heavy expense of cartage of coal and stores where pumping is required, and the equally heavy cost of the cartage of the produce ef the mines to a railway.

The explorations at the New Crickheath Lead Mine, near Llanymynech, are looking very promising at present, as are also the new explorations in search of copper to the south of the above mine. These works are undertaken by private gentlemen, under the direction of Mr. Henderson, their engineer.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Feb. 19.—The liquidators of the late West of England Bank have issued a circular to the creditors, in which they ask whether the latter are prepared to accept the sum of 3*s.* 6d. in 1*l.* and waive all claim for interest. Already 16*s.* 6d. has been paid, and this 3*s.* 6d., if accepted, will bring up the amount to 20*s.* in 1*l.* The Penarth Harbour, Dock, and Railway Company directors recommend a dividend for the past half-year at the rate of 4½ per cent. per annum, and the Bristol and South Wales Wagon Company has been enabled to declare the usual dividend at the rate of 10 per cent. per annum for the last half of 1879. The success of the Merthyr and Dowlais tramway scheme seems assured—2000*l.* worth of shares have already been allotted. Trade is satisfactorily progressing at the Alexandra (Newport) Docks, and at the forthcoming meeting it is believed that the original shareholders will not be forgotten in the distribution of dividend. An explosion of gas has taken place at the Glynfach Colliery, Rhondda Valley, by which the manager and two men have been severely burnt.

As for the Iron and Steel Trades, about the average amount of activity is observable. As already stated, an increase in wages has been accorded at one or two of the principal works. Cyfartha is still briskly employed, and the number of blast-furnaces blown-in during the last three or four months has been very large. During the past few days there cannot be said to be an increase in prices, although these have an upward tendency, and are fairly good. The American demand is fully up to the average, and new rails, old rails, and old material have been briskly forwarded to the United States; in fact, most of the shipments during the past week are to that quarter. There is an almost entire absence of the continental

demand, but requirements are in hand both for India and Brazil, and some clearances have been made to Mexico. There is a fair average demand for bars, and pig-iron is quickly bought up. The quantity of Spanish ore arriving is extensive, and altogether trade seems to be rapidly recovering itself.

In the Tin-Plate Trade prices are firm, but have not much altered. It is freely stated that the Lion Mill, Nant-y-Glo, has passed into the hands of a firm who intend to carry on the manufacture of tin-plates there. The demand is good. Beyond the 3d. or 6d. per ton advance in the price of coal already noticed there is no further change to note, and in some cases even this is hard now to obtain. Still sellers look hopefully at the future, and resist endeavours made to induce them to take large contracts for forward delivery at present quotations. Generally speaking, business at the docks has not been quite so brisk, nor shipments quite so large. Still, however, there is a fair demand for steam coal, and particularly on foreign account. House qualities are moderately well enquired for, and anthracite is without alteration. The sliding scale arrangement so far has worked well, and the men seem fully satisfied with it. The Caerphilly Collieries are generally working regularly. At Dinas Colliery the men have struck into coal in the hard heading, and coal has been sent to the surface. Some 40 years ago the Gethin Colliery explosion happened, and 13 persons are now left who receive doles from the subscription raised at the time of the disaster. The Patent Fuel Trade shows a little more animation. The coke department is fairly active, and very high prices are still maintained. At Dowlais no less than 80 ovens are, it is said, to be built.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Feb. 19.—In the lead mining districts a good deal of interest has been manifested in a trial which has just come off, in which the peculiar mining laws of Derbyshire were forcibly illustrated. Any person it appears has a right to enter upon certain lands without the owners' leave, and search for and raise lead ore. The latter belonged to the miner, whilst the material from which it was extracted belonged to the owner of the land. The defendants had worked a mine, but placed the produce of it on adjoining property, and also went beyond their boundary in getting certain material. It was held by the Lord Chief Justice that in the case of a mine being worked beyond the surface of the allotment, and under another man's land, another shaft should be sunk, because the Act of Parliament, whilst saddling the owner with the liability of this work, also gave him his rights, so that the owner of the surface was entitled to the possession of the spar or other material which came from beneath the surface of his land. After a lengthy trial an agreement was come to giving the plaintiffs, Messrs. Wake, of Sheffield, a verdict for 20*l.*, with an injunction restraining the defendants from bringing the material from the Tideslow Mine through the Mock Mine (defendants'), and depositing it upon the plaintiffs' land. Whatever good the mining customs may have done some generations ago, it is evident that they are not suited to the present age, in which the rights of property are recognised, so that the sooner a change takes place the better. Mining operations, however, go on much as usual, a fair tonnage of ore being raised.

At the ironworks in the Chesterfield district, as well as those along the Erewash Valley, business keeps up well, there being a steady demand for pig, whilst prices are comparatively free from the fluctuations that prevailed at the commencement of the year. A large tonnage of ironstone continues to be imported from Northamptonshire, so that not so much as formerly is now raised at the local pits. The rolling mills have been kept fairly going, and the foundries are favourably off for work. The collieries have been working steadily, and there has been no falling off with respect to the London trade, the complaint being that prices have reached a point that barely pays, whilst no change for the better can now be expected, seeing that as the year advances the consumption will decline. There has been one noticeable feature of late in connection with the London coal markets, and that is that the price for seaborne coal and the best inland conveyed by railway, have nearly come down to a level, although the difference between the two has been something like 3s. a ton, the Wallsend of course being the dearest. Steam coal has not much improved of late, and prices are still unremunerative. At Dronfield business has been active as regards rails.

In Sheffield the general trade continues good, and heavy orders have of late been received both on home and foreign account. There has been a considerable increase in the production of both Bessemer and crucible steel, a good deal of the latter being sent away in a plain state, whilst of the former a heavy tonnage is absorbed at the rail mills, and for some descriptions of cutlery and other goods. Table and other knives have been in rather better request, and orders from America have come freely to hand, whilst travellers at home give more cheering reports. Ship and other plates are still in request, as well as heavy plates, sheets, and hoop iron. Hematite and common pig have become more settled in price, and purchasers seem less anxious to purchase and stock than they did.

At the Monk Bretton Colliery the men are still out, as are those at the Barrow Hematite, but the latter are expected to resume work in a few days.

In the South Yorkshire district the house coal trade has been favourable for the time of year, but at the rates at which it has to be sold profit is out of the question, and those colliery owners who are able to keep their works going without actual loss may be considered fortunate. Good soft coal is being sold at from 6s. to 7s. a ton, and steam at even less than that. Engine coal does not sell at all well, but a steady business is being done in that for gas-making purposes. Coke sells well just now, a good deal being sent into Lincolnshire and the Sheffield district.

TRADE OF THE TYNE AND WEAR.

Feb. 18.—There has been an improvement in coal shipments at Tyne Dock, but some of the large collieries have not been fully employed lately in Durham; this applies to works who have not secured contracts for gas and other coals, some of these have been laid off a few days lately. The coke trade continues brisk, and new ovens are being built at many places, and old ones repaired in all directions. The general price of coke for early delivery has been 14s. 6d. to 15s. 6d. at the ovens. The demand for coal for manufacturing purposes has improved a little, but the demand for house coal is still very quiet. The demand for Northumberland steam coal is good, and this staple trade has been in a pretty active condition, the majority of the pits having been well employed. The orders for the best steam and second-class coal continue to be maintained, and with the opening of the Baltic ports the prosperity of this industry will increase. At Barrington Colliery, lately re-started, the number of hands is to be largely increased, and this is the case at North Seaton also, and other large works.

The increase in the value of minerals of course causes inquiry for good mines of all kinds—coal, iron, lead, &c. Although Northumberland and Durham are very rich in coal, it is only in the western parts of those counties that lead is found in abundance, some very good lead mines are found in the western districts, and some of them have been worked for long periods in Teesdale and West Northumberland. These valuable veins of lead are found in connection with the limestone formation, and we believe the whin dykes which intersect those measures. A lead mine, which is we believe situated in the north-eastern portion of the lead district, was worked some time at Bavington, but the working was suspended when the value of lead was very low; since the great advance in the value of this mineral this mine has deservedly attracted some attention, and it is probable that its working will be resumed shortly. There are some good promising lodes proved in these mines. The fire-brick trade has fully participated in the improvement which has taken place generally in the staple trades of the district; at present there is a good demand for fire-bricks and fire-clay goods generally. A substantial advance has been got on the prices of most of these goods, and there is a good demand. Most of the works are well employed, and prices are very firm, with a rising tendency. The iron trade continues to improve as time advances. The improvement in the Scotch iron trade has caused increased firmness here. The demand for Cleveland iron has improved, and shipments are large, averaging 3500 tons per day. The shipments to America are large, and prices are still steadily advancing; No. 3 is now 62s. to 62s. 6d. net. The finished iron trade is steady at late rates; there is no great alteration in prices.

There was a crowded attendance on 'Change at Middlesborough on Tuesday, and the market was much firmer. The earlier transactions were based upon No. 3 Cleveland pig selling at 63s. per ton, which was an advance of 2s. upon the quotations of last week, and when it was known that Messrs. Connal and Co.'s warrant stores had decreased about 1000 tons during the week, the total having been reduced to 107,100 tons, the tendency was further upward. At the close of the market makers would not dispose of No. 3 for less than 63s. 6d. for immediate delivery, 64s. for delivery next month, 65s. delivered over the quarter. Forge iron is still in great demand, and holders can easily sell at 64s. 6d. per ton. No time is being lost in getting ready the several furnaces which have been so long idle, and in the course of a few weeks many of them will be in operation. But so steady is the demand for all kinds of iron that it is believed that if the whole of the furnaces in the North of England were blown in the production would find a remunerative market. Great activity still prevails in the finished iron trade. Very nearly all the works are now in operation. Instead of there being an outcry about surplus labour there is now some trouble in procuring a sufficient number of workmen for the carrying on of the several works. There is a good quantity of shipbuilding iron, and buyers are pressing for deliveries. The quotations for finished iron are—plates, 9*l.* 10s. to 9*l.* 15s. per ton; bars, 8*l.* 10s.; angles, 8*l.* 15s., and rails 8*l.* 15s. to 9*l.* Refined iron is selling at 4*l.* 10s. per ton, and warrants are quoted 64s. Shipments continue brisk. Engineers and shipbuilders are satisfied with their prospects of trade for the year. Founders have a good deal of work in hand, and business generally is better. Throughout Cleveland the ironstone mines are working steadily, and arrangements are being made for further increasing the output of stone. In order to meet the extension in the mining trades the North-Eastern Railway Company have ordered 1000 new wagons to be added to their service. A dispute of workmen which had ariseu at the Bowerfield Ironworks, Stockton, has been referred to arbitration .

MANUFACTURE OF COKE.—A patent of very great importance to coke manufactures has just been taken out by Mr. A M. Chambers, of Horncliffe Collieries, near Sheffield, and when it has been applied to the great number of coke ovens in Northumberland and Durham a great change will come over the production of coke, both as regards quantity and quality. Mr. Chamber's invention is of a very simple character. Instead of allowing the draught to go over the burning coal by the furnace door, Mr. Chambers builds up the furnace door entirely, and drives in hot air by means of a pipe over the face of the coal in a direct line to the exit flue; by this means the products of combustion pass from the oven to the main flue or chimney; a greater draught is thus obtained, a quicker make of coke, and the sulphur is almost entirely got rid of. Mr. Chambers claims for his invention the following advantages:—At least 15 per cent. more coke from the same quantity of coal, a much larger quantity of coke per week in the same number of ovens, the objectional sulphur is almost entirely got rid of, a much denser coke with less "breeze" and dust and free from black ends, a considerable saving in the cost of coking, and that it is easily applied to existing ovens. The patent has been applied to 68 coke ovens at Westwood, near Sheffield, with the most perfect results.

CO-OPERATIVE COAL MINING.

The half-yearly meeting of shareholders in the Leeds and Yorkshire Co-operative Coal Mining Company (Limited), was held in the Philosophical Hall, Leeds, on Saturday. There was a large attendance of shareholders, and the proceedings were at times very noisy. The Mayor of Leeds (Alderman Tatham) chairman of the directors, presided.—In moving the adoptlon of the report, he said that the directors met the shareholders with a feeling of disappointment. At the last half-yearly meeting they were not in a position to declare any dividend, but they had hoped that trade would improve, and enable them to do something at this meeting. In this they had been disappointed. He had heard it asked why it was that with one of the best seams of coal in Yorkshire, and one of best working plants that could be laid down, they were in their present position. They were not alone in that position. He knew large manufacturing concerns, with the best plant, managed with the utmost skill, which had nevertheless incurred heavy losses at certain times. The collieries in their own neighbourhood, though fully developed and having the advantage of an established connection, were in no better position than themselves. The demand for coal had not enabled them to sell half the quantity they could have raised. Still they had made ends meet, and ought to be thankful that their position was no worse than it is. As there was no division of profits, the directors had relinquished their fees for the half-year.—Mr. R. Buckton seconded the adoption of the report, and it was agreed to.—The Mayor and Mr. Talbot, retiring directors, were re-elected. There were considerably noisy discussions over the re-election of Mr. Talbot, raised by one of the shareholders who wished to see "new blood" on the board of directors. He believed that the directors had done their best, but then he added, "some men's best was only very bad." There was further discussion on a motion by the same shareholder to the effect that the question of the directors' fees should be taken into consideration at the next meeting. He argued that the fees had never been properly voted, but the motion was rejected by a large majority, after an emphatic protest against it by several of the shareholders. Mr. J. J. Wilson and Mr. J. W. Close having been re-elected auditors, the meeting was made extraordinary to consider the resolution passed at the last half-yearly meeting, recommending the abolition of the co-operative clauses in the company's constitution. The Chairman explained that the colliery was started on a co-operative basis, with the view that after paying the shareholders a dividend of 10 per cent. the surplus profit should be divided equitably between the shareholders, the customers being shareholders, and the workmen. It was thought by this provision that they would obtain better work and get more custom, but experience had not fulfilled that expectation. They had failed to find any advantage for their working shareholders or for the buyers of coal, because if the latter could get coal a penny or twopence a ton cheaper anywhere else they naturally went there. It was, therefore, proposed, in the interests of the shareholders, that the company should become simply a coal mining company, and that the profits, whatever they might be, should be divided among the shareholders. He therefore moved—"That the name of the company be changed from the "Leeds and Yorkshire—Co-operative Coal Mining Company (Limited)" to the "Lofthouse Colliery (Limited)."—Mr. Nichols seconded the motion, which was agreed to without discussion.—It was also agreed that the Memorandum and Articles of Association should be amended accordingly.—The Chairman next moved—"That the last two sentences of the third clause of the Memorandum of Association, that is to say 'The division of the profits of the company on the basis of a community of right thereto, as between the capital of the company, the shareholders who may be purchasers of coal from the company, and the wage earnings of the officers, servants, and operatives employed by the company; the granting of rewards to the officers, servants, or operatives of the company for superior work or for quantity of work,' be annulled."—Mr. Henry Walmsley, Leeds Industrial Co-operative Society, suggested that the last clause as to granting rewards should be retained.—The Chairman accepted the suggestion, and with that alteration his motion was adopted.—The Chairman next moved an alteration in No. 71 of the Articles of Association, to the effect that the words, "twenty original shares," be struck out, and the words, "one hundred original shares," inserted in their place. He explained that it was thought that a shareholder, before being eligible for the post of director, should hold a substantial interest in the company, and hence the alteration proposed. This was seconded, and gave rise to an angry discussion. It was not known for some time how many shareholders held 100 original shares in the company, but the number was found to be 45. After a protracted discussion the motion was carried by a majority of 19 votes of those actually present, but in addition the chairman held proxies for 124 shareholders in its favour. The other resolutions were formal, and before the meeting concluded a vote of thanks was passed to the chairman and the directors.

WIGAN COAL AND IRON COMPANY.

The directors of this company, one of the largest coal and iron companies in the kingdom, in their report, to be submitted to the meeting of shareholders next week, state that, owing to the continued depression in the coal trade, it had been impossible to keep the pits in full work, except for a short time at the latter end of the half-year. The dispute with the colliers at Crawford No. 1 and Woodshaw pits having been satisfactorily arranged, these pits were again at work. From this cause, and owing to the further development of the new openings, the production had increased and the sales had also increased. The selling price of fuel had again been lower, notwithstanding the increased activity in the iron trade. For the first quarter prices of iron continued to recede; the market then took an upward course, and there was a marked increase in prices during the latter part of the half-year. The full benefit of the incrcased prices had not yet been felt, because the orders at the lower rates had first to be fulfilled. No reduction in the wages paid to the colliers had been made, but an advance of 5 per cent. was given to the men at the blast-furnaces at the end of the half-year. The renewed activity in the iron trade has enabled the number of furnaces at work to be increased, and 7 were now at work, as against 4 in the preceding half-year. The directors present the balance sheet, the result of which they consider still far from being satisfactory, which shows a profit of 17,823*l.*, this being reduced by the adverse balance left on Jan. 30, 1879, to 13,878*l.* The directors recommend a dividend after the rate of 1½ per cent. per annum, free of income tax, which will absorb 13,573*l.*, and leave a sum of 206*l.* to be carried forward. The capital of the company is 1,809,725*l.*, and the sum of 203,566*l.* has been borrowed on mortgage or debenture bonds. The amount standing to the debit of plant account is 1,503,832*l.*, the sum of 33,438*l.* having been deducted for depreciation during the half-year. The value of the stock held on Dec. 31 was 152,419*l.*, being less by 10,315*l.* than that held on June 30 last.

Meetings of Public Companies.

WHEAL ELIZA MINE.

A meeting of the adventurers was held at the Queen's Hotel, Birmingham, on Tuesday,—Mr. STEPHEN BARKER in the chair.

The report and accounts were taken as read.

The CHAIRMAN said he was happy to meet the shareholders under the present improved state of the tin trade, and from the great demand existing for tin-plates he thought there was every reason to believe good prices would continue for some time. He remarked that it had often been said and believed in by many that it was all over with the Cornish tin mines owing to the great competition with Australia; he, however, was of a different opinion as to the standing of the Cornish mines, because the Australian mines were compelled to close last year on account of the low prices, and the supply from that quarter had consequently immensely fallen off. With improved machinery, and by the use of dynamite for blasting down the ore, tin could now be produced at Cornwall much cheaper than it was 10 years ago. The machinery and arrangements at Wheal Eliza were of the most complete and perfect description of any mine in the whole of Cornwall. The Wheal Eliza Mine has, he stated, about 5 miles of roads underground laid with rails, and all the ore was being broken after arriving at the surface with the most powerful stone-breaking machinery yet introduced. The workpeople were well attended to, rooms being provided which were warmed with hot air for changing their clothes before they go to and after they re turn from their work underground. Cold and warm baths are also provided for their use, and they have a separate dining hall for the men and women employed about the mine, with the necessary proper cooking conveniences.

The CHAIRMAN stated that during the last half-year they had sold 294 tons 13 cwts. 0 qr. 11 lbs. of black tin, realising 14,295*l.* 7s. 7d., upon which a net profit of 5106*l.* 9s. 1d. had been realised. On Oct. 4 a dividend of 2*l.* per share had been paid, and he now proposed, with their sanction, that a further dividend of 3*l.* per share should be declared at once, which would make a total of 5*l.* per share for the last half-year. He hoped this would be thoroughly satisfactory to the shareholders.

Capt. R. H. WILLIAMS, C.E. (the manager), who was present, reported that the mine was looking as well as at any previous period of its history, and stated that from the further increased price of tin since the accounts were made up the profits for the next half-year would be in all probability more than the one just past.

Upon the conclusion of the Chairman's remarks, it was moved by Mr. H. LOWE, and seconded by Mr. J. A. WILLIAMS, and resolved "That a dividend of 3*l.* per share be now declared, and payable forthwith."

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The ordinary general meeting of proprietors was held at the Cannon-street Hotel, on Thursday,

Mr. R. A. ROUTH, the Chairman, presiding.

Mr. C. B. ROGERS (the secretary) read the notice calling the meeting, and the report of the directors was taken as read.

The CHAIRMAN said he would run through one or two of the figures in the report, and explain the position of the company as regarded the business done during the year under consideration. The total number of tons of ore received during 1878-79 was 10,239 tons, as against 16,194 tons 7 cwts. 3 qrs. in 1877-78. The quantity of ore, regulus, and precipitate smelted at the Port Adelaide Smelting Works from July 1, 1878, to June 30, 1879, was 3108 tons 9 cwts. 2 qrs., against 5780 tons 4 cwts. in the corresponding period of 1877-78; whilst the quantity smelted at the Newcastle Smelting Works was 7502 tons 4 cwts., against 9096 tons 4 cwts. 2 qrs. The quantity of copper made at the Port Adelaide Smelting Works, from July 1, 1878, to June 30, 1879, was 666 tons 3 cwts. 1 qr. 2 lbs., against 1167 tons 3 cwts. 3 qrs. 6 lbs. in the same period of 1877-8, and the quantity of copper made at the Newcastle Smelting Works during the same period was 1196 tons 8 cwts. 3 qrs. 23 lbs., against 1457 tons 2 cwts. 1 qr. 11 lbs. The point to which he would just call attention was the supply of ore, which, in the year under review, showed a decrease of 5955 tons 7 cwts. 3 qrs. as compared with the previous year. This had been caused by so many mines having been obliged to suspend work in consequence of the low prices of copper. The quantity of ore from the Balade Mine was about 917 tons less than in the previous year's working. Of course it stands to reason that if the company had 5955 tons of ore less copper in the year under review than in the previous year, the amount of profits must have been materially affected by it. The reason of this falling off in the produce had been, as he had mentioned, the extremely low price of copper, which threw out of work many of the mines; and, although the company had a most energetic manager, who endeavoured to make up for that, it was impossible to get the full quantity of ore they would otherwise have done; but the most recent advices from the manager stated that the prospect of the future ore supplies was improving. This showed that the falling off in the supplies simply arose from the low price of copper, and as the price of copper increased there was no doubt there would be an increase in the outturn of copper. But it must be borne in mind that when a mine was thrown out of work it was not easy to put it in full work immediately. On that point the manager stated—"I can scarcely expect any great increase in South Australian supplies during the current year, but the prospects are better, and if the price does not recede we shall see better results. The second matter which affected the company was the fluctuation in prices. In January, 1879, the price of copper was 65*l.* per ton; subsequently to that it fell as low as 60*l.* per ton. At the present time it ranged at from 80*l.* to 81*l.* per ton; therefore it would be seen by the shareholders that there had been heavy fluctuations in the price during the period over which the present account extended. The third matter which affected the profits this year was the falling off in the wharf profits, which arose from the necessity for deepening the wharf in order to bring in the large vessels which were now passing from this country to Australia. He was happy to say that the whole of the deepening was now completed, and in the year which was now succeeding there was no doubt that the wharf profits would not only come up to what they were before, but in all probability would find a very considerable improvement. Those were the three points which had affected the profits—first, the falling off in the quantity of ore; secondly, the fluctuations in price; and thirdly, that the wharf profits during the greater portion of the year were nothing, owing to the repairs which were going on. With regard to the year which was now progressing he thought that he could say that there was a great increase in the activity of the mines, the price of copper having effected that. As soon as the mines came into full activity there would be no difficulty in getting the same quantity of ore as some time ago, and perhaps more. The second point in favour of the company in future was that the Port Augusta Railway, which when completed would be about 200 miles in length, would soon be opened as far as Wonoka, a distance of 80 miles. The total completion of the line would take about another two years; but even when the first 100 miles were completed it would be an assistance. When the line was

finished it would open up a fine country, full of mines, and the difficulty which the company had sometimes experienced of getting sufficient ore for the furnaces would entirely cease, and they would be able to make better returns than now. The directors were anxious to keep all the furnaces at work, and get all the ore they could. Another important point was with regard to the revival of trade in this country. When the statement was made by Lord Beaconsfield, at the Mansion House, in November last, that there was a revival in trade, many people doubted whether there was reality in what he said; but since then it had been proved beyond question that a revival had taken place, and the fact was now established beyond all question. (Hear, hear.) There had also been a revival of the exports to America—a thing which they had not had for many years; therefore he could not help thinking that, on the whole, the position of the company was exceedingly satisfactory. (Hear, hear.) They did not want high prices; what they wanted was steady prices—and if copper remained at the present price of 80*l.* or 81*l.* per ton the company could make satisfactory profits. If the company could get an ample supply of ore they could make good dividends; but he need not tell them the fluctuations of prices the last four years and difficulty and stagnation of business had been so great that to steer through that period had been a matter of great difficulty to the directors. He hoped the future was more promising, and he could only say that no effort would be spared on the part of the directors to make the company as flourishing as possible. In conclusion, the Chairman moved the reception and adoption of the report and accounts.

Mr. ALFRED COBBETT (the Deputy-Chairman) seconded the motion, which was put and carried without any discussion.

On the motion of the CHAIRMAN, seconded by Mr. SPENCER HERAPATH, a dividend of 1s. per share was then declared payable on and after March 1, free of income tax.

The CHAIRMAN moved the re-election of Mr. J. R. Frewer as a director.

Mr. ALFRED COBBETT seconded the motion, which was put, and carried.

Mr. A. COBBETT proposed the re-election as a director of Mr. R. A. Routh, and said he was sure the motion would be heartily passed by all present. Mr. Routh had been Chairman of the company for 20 years, and had most carefully and assiduously attended to his duties, and during the whole 20 years had been only three times absent from the general meetings of shareholders. (Hear, hear.)

Mr. SPENCER HERAPATH said he had great pleasure in seconding the resolution. Mr. Routh and himself joined the board together over 20 years ago; and he might say, both for Mr. Routh and himself, that they had honestly and conscientiously discharged their duties.

The resolution was put and carried.

The CHAIRMAN acknowledged his re-election.

A vote of thanks to the Chairman and Directors closed the proceedings.

CWM DWYFOR MINING COMPANY.

A general meeting of shareholders was held at the company's offices, St. Clement's House, Clement's-lane, on Wednesday,—

Mr. JAMES STEWART in the chair.

The SECRETARY read the notice convening the meeting, and a letter from the late agent, Capt. Jewell:—

Feb. 14.—I consider you have as good a chance of success at Cwm Dwyfor as they have at Symdde Dylluan, and for convenience of working I would certainly prefer Cwm Dwyfor, as by extending the adit there the lodes would be cut at a good depth, and no lifting or pumping will be required. I should, however, strongly advise you to carry on the work you began at Morgan's shaft on the Brynarian property (if it is still in your hands) by driving the level at the 20 a few fathoms. I had splendid lumps of lead ore from 40 to 70 lbs. weight broken from this part of that property. There is also another point there worthy of completion—the driving of the boundary adit another 20 fms., so as to get under the old Brynarian workings, where the lode was several feet wide.—JOSEPH JEWELL.

The SECRETARY also read a letter from the owner of the Brynarian property, in which he stated that he had arranged to commence working there on his own account, but that if the company were willing to complete their trial of the property at once he would allow them to do so. He also explained that the present meeting had been called to see if advantage could be taken of the improved price of lead to carry out the trial commenced at the Brynarian property, which gave every promise of success. He mentioned also that the Symdde Dylluan Mine, which adjoins the Cwm Dwyfor Mine, and of which it was believed some of the lodes passed through the Cwm Dwyfor property, has just been restarted, after being idle for some years. It was, however, at present proposed to confine operations to the Brynarian property, of which the owner had given the company the option of purchase on fair terms, and it was now intended to carry out the trial at the two points named by Capt. Jewell, provided a sufficient sum could be raised.

A SHAREHOLDER enquired what would be the cost of driving the deep level at Cwm Dwyfor a sufficient distance to cut the lodes intersected at the 10 fm. level cross-cut?——The SECRETARY replied that the estimated cost was 2000*l.*, whilst the amount required for the Brynarian property was 400*l.* only.

Mr. HEWETSON considered the suggestion that instead of issuing 15 per cent. preference shares a certain number of the unallotted shares be offered to the shareholders at 10s. per share discount was a common sense one, as by this means the value of the ordinary shares would be preserved, whilst by the issue of 15 per cent. preference shares they would be swamped.

Mr. BARTON (a director) thought the suggestion made a very good one, provided the shareholders would come forward and take up the shares. He had visited the Brynarian property, and had some conversation afterwards with Capt. Ridge (now deceased), who seemed confident as to the success of the trial there, though he would not pledge himself, and he seemed very honest and trustworthy.

Mr. CORDERY said it would be a pity if the property was sacrificed now when there appeared to be a chance of doing something, and it would certainly be better for the shareholders to complete the trial.

After some further conversation it was moved by Mr. HYDE, seconded by Mr. CORDERY, and unanimously resolved—"That 1000 of the unallotted ordinary shares be issued at a discount of 10s. per share."

The proceedings terminated with the usual complimentary vote.

SENTEIN MINING COMPANY.

An extraordinary general meeting of shareholders was held at the offices of the company, Great Winchester-street, on Tuesday,—Mr. W. STANDING, the Chairman of the company, presiding, for the purpose of confirming the following special resolutions passed at the extraordinary general meeting, held on Jan. 29 last:—

1.—That the capital of the company be increased to 50,000*l.* by the issue of new capital to the aggregate amount of 18,000*l.*, divided into 18,000 shares of 1*l.* each, and that such new shares be entitled to dividend *pari passu* with the original shares in the company's capital, in proportion to the amount for the time being called and paid on the original shares and new shares respectively.

2.—That 5000 of such new shares be allotted to the several shareholders, who by arrangement and in anticipation of such allotment have already paid 10s. per share on such 5000 shares, in order to place the company in possession of funds wherewith to discharge some of its liabilities.

3.—That the remaining 13,000 new shares be offered in the first instance at par to the members in the proportion and in the manner provided by Article 27 of Table A in the first Schedule to the Companies Act, 1862; and that such of the said new shares as shall not be taken up by the members in response to the offer so to be made within ten days of the date of such offer being made, shall be allotted at par to such persons as the directors may determine, or shall be otherwise disposed of as the directors may deem to be most beneficial to the company.

Mr. J. R. COOMBS (secretary) read the notice calling the meeting.

The CHAIRMAN said—Gentlemen, you are all aware of the purport of this meeting, which is merely of a formal character—to confirm certain resolutions passed at the extraordinary general meeting, held on Jan. 29 last, increasing the capital of the company from 32,000*l.* to 50,000*l.*, by the issue of 18,000 new shares of 1*l.* each. With your permission I will now move that the first resolution be confirmed.——The resolution was seconded, and carried unanimously.

On the motion of the CHAIRMAN, seconded by two SHAREHOLDERS, the other two resolutions were unanimously carried.

The CHAIRMAN—Gentlemen, this concludes the business of the meeting, but I take this opportunity of stating, and am sure you will be glad to know, that everything at the mine is progressing in the most satisfactory manner, although we have had some difficulties and delays to encounter in consequence of the severity of the frost. Our managing director is present, and I am sure will answer any question which any shareholders may put.

Mr. WALKER asked whether much ore was now being raised from the mine?

The MANAGING DIRECTOR said that at present they were only raising about 200 tons of ore per month, in consequence of the men being employed in laying a new tramroad from No. 5, or St. Barbe level, to the second station of the wire-rope. This work would, however, be completed in a few days, when the men would resume stoping, and it might fairly be expected that, within a very short time, the monthly output of ore would be increased to 2000 or even 3000 tons. (Hear, hear.)

Mr. WALKER asked whether there was any perceptible difference in the quality of the ore now being raised, or was it of the same quality as that raised during the past year?——The MANAGING DIRECTOR said the ore now being raised was of a much better quality than any before raised; it was much richer in silver-lead, and there was less blende, which would make a great difference in the cost of dressing. The new caunter lode, recently cut in No. 3 and No. 4 levels, was a massive strong lode, easy for driving, and yielding from 4 to 6 tons of very superior quality ore per fathom. From what could as yet be seen of this lode, it seemed to be crossing the main lode at right angles north and south, with a westerly underlie, and was in whole or virgin ground to surface, very little, if any, work having been done on it by the former proprietors of the mine. This lode was really a new mine in itself, and from present appearances would add immensely to the value of the property.

A SHAREHOLDER asked when the wire-rope tramway would be finished?——Mr. BULLIVANT (the manufacturer of the wire rope) said he had received advices from his men to the effect that the last splice had been made. The work had been much delayed by the severity of the weather, but he hoped his men would be in London within three weeks, as very little now remained to be done to complete the work.

Mr. WALKER asked how much ore per day the tramway would convey from the mine?——Mr. BULLIVANT: You have a very substantial tramway, and 10 tons per hour, or 100 tons per day, can be brought down, but during the summer months up to 180 tons can be brought down.

Mr. WALKER: Mr. Managing Director, can you tell the meeting how much ore per day you can raise?——The MANAGING DIRECTOR: At present we are making arrangements to raise 100 tons daily, but this quantity, large as it may appear, can be increased. It depends entirely upon the number of men employed. The quantity of ore to be got out appears from our accounts to be very large, and will take years to mine. (Hear, hear.)

Mr. BULLIVANT asked what arrangements were being made to increase the dressing power. He believed, from all he heard, that they had a great mine, and he should recommend that immediate steps be taken to erect the necessary additional machinery.——The CHAIRMAN: The directors have to-day to consider the matter, which is of great importance, as it appears from advices received from the manager that three times the quantity, or more, could be raised than our present dressing-floors are capable of dressing. I hope before the end of the week the necessary additional machinery will be ordered. (Hear, hear.)

Mr. WALKER: Have the 18,000 shares all been taken up?——The CHAIRMAN: We have received applications for a great many more shares than we can allot.

Mr. WALKER: When will the allotment take place?——The CHAIRMAN: The secretary will send out the usual notices and forms of application immediately, and the allotment will take place as quickly as possible; but we must conform to the Articles of Association.

A cordial vote of thanks was then passed to the Chairman and directors, and the meeting broke up.

[FIRST NOTICE.]

METALLURGY: THE ART OF EXTRACTING METALS FROM THEIR ORES.

SILVER AND GOLD.—PART I.

The first part of the long-promised volume by Dr. PERCY, F.R.S., on the metallurgy of the precious metals, has just been issued under the above title (London: John Murray, Albemarle-street) has now been issued, and will justify the most sanguine expectations likely to have been formed of it. The author acknowledges the assistance which he has received from various metallurgists at home and abroad and expresses the hope that as his resignation of the lectureship at the Royal School of Mines will place more time at his disposal he will speedily complete his task. A brief historical notice of the metal is followed by an account of the physical properties of silver, and its chemical properties are then treated of; and it may here be mentioned that, to make the volume as widely useful as possible, both the old and the new notations have been given—the latter, to prevent confusion, being printed between thick brackets. The different characters of silver-lead from different places noticed by the author are very interesting. Eleven specimens of galena are mentioned which contained from 0·033 to 3 per cent. of silver, yet upon similar treatment with mercury nine of them yielded up none of their silver, whilst the other two yielded up one-sixth and one-third respectively of their silver, and what is still more curious is that whilst the Giromagny galena, which contained only 0·05 per cent. of silver, yielded one-third thereof to the mercury, the Sala galena, which contained 0·80 per cent., or 16 times more silver, yielded to the mercury less than one-sixth of the silver it contained. Hence Malaguti and Durocher infer that galenas which are "docile to amalgamation" contain sulphide of silver, of which part at least is in the state of simple mechanical mixture, and that galenas which yield none of their silver to mercury probably contain sulphide of silver in actual combination with the sulphide of lead. Silver in combination with oxygen, sulphur, selenium, tellurium, chlorine, bromine, iodine, fluorine, cyanogen, nitrogen, carbon, silicon, boron, phosphorus, arsenic, and antimony are in turn treated of, and there is then one chapter on alloys of silver, and another on silver ores.

Having thus afforded the student or reader an abundance of information as to the physical and chemical properties of silver, and as to the character of the minerals in which he is likely to have the metal presented to him for treatment, and thus given him an ample basis to work upon, the assaying and smelting of silver ores are discussed with much detail. Silver assaying, both by the dry and volumetric methods, is carefully explained, the section terminating with some useful hints upon the states in which silver is imported into England and the necessity of precautions with respect to its purchase. In the section devoted to the separation of silver from metallic copper by the liquation process, the whole subject is treated exhaustively, and many interesting processes not generally known to the metallurgists of this country are described. Silver smelting is treated of under three distinct heads—smelting ore containing silver chiefly in the metallic state, combined silver and lead smelting, and amalgamation or the extraction of silver from its ores by means of mercury. The numerous illustrations being to scale, and mostly from original drawings, will prove of the utmost possible utility, and although reading alone can never make a sound practical metallurgist, it may safely be said that he who has carefully studied Dr. Percy's book will be in a much better position to conduct a silver extraction works than many who, without scientific training, have had much longer practical experience. More detailed notices of the volume will be published in future Journals, but this will will suffice for the moment to give an idea of the completeness and utility of the work.

MINERAL WEALTH OF NEW SOUTH WALES.

The annual report for 1878 of the New South Wales Department of Mines, which has recently been issued, and with a copy of which we have been favoured by the Minister for Mines, offers congratulation that notwithstanding the considerable decrease in the yield of gold, which was a few years ago the great mineral production of the country, the total value of all minerals raised in 1878 remains much the same as that of past years, being above the average value of the last ten years by about 40,000*l.* This result is due chiefly to the increased yield of coal, which has steadily grown year by year till out of a total mineral production in the Colony for 1878, valued at 2,172,000*l.*, it reached in that year a value of 921,000*l.* The colony is now proved to be very rich in shale, copper, silver, and other minerals and metals; there has been a slightly increased production, although copper continues (September, 1879) low. As regards the production of gold, it may be anticipated that ere long this great branch of mining industry will revive. There is always the great probability existing of new gold fields being discovered, particularly in that vast unprospected country lying at the west and north-west of the colony, and in addition to this the gold miner is now successfully working auriferous reefs at depths at which it was thought some time back improbable, if not impossible, that payable gold could be obtained.

The continued annual yield from the various mines of New South Wales of over 2,000,000*l.* worth of metals and minerals is a circumstance of which so young a country may well be proud, particularly when it is considered that this amount is derived not only, or even in a great degree, from a metal so uncertain in its yield as gold, but from a variety of other metals and minerals. It may be reasonably anticipated that a great expansion must take place in the production of such vast mineral treasures as the colony posseses, when the improved mechanical appliances are brought into operation in New South Wales, which are now so much in use in many of the old countries of the world, and when the capitalists becomes alive to the great wealth which can be obtained by the investment of his money in legitimate mining enterprise. The production in 1878 was—gold, 119,665¼ ozs., worth 430,033*l.*; silver, 60,563 ozs., 13,291*l.*; coal, 1,575,497 tons, 920,936*l.*; shale, 24,371 tons, 57,211*l.*; tin metal about 7000 tons, the value being 395,822*l.*; copper, 5000 tons, 345,158*l.*; iron, 900 tons, 6666*l.*; and antimony, 50 tons, 1964*l*

GOLD MINING IN VICTORIA.—We have been favoured by Major THOMAS COUCHMAN, the Secretary for Mines, with the reports of the Mining Surveyors and Registrars for the quarter ended Sept. 30. The total number of miners employed was 37,703, of whom 13,719 Europeans and 9123 Chinese were engaged in alluvial mining; and 14,681 Europeans and 180 Chinese in quartz mining. There were 237 steam engines of 6298-horse power in the aggregate employed in winding, pumping, &c., in connection with alluvial mining, and 801 engines of 16,566-horse power in connection with quartz mining. The approximate value of the mining plant in use was 1,908,827*l.* The total quantity of gold obtained during the quarter was—from alluvial 74,536½ ozs., and from quartz 115,112¼ ozs.; together 189,648¾ ozs. From information obtained relative to the quantity of quartz, quartz tailings, and mullock crushed, and pyrites and blanketings operated on during the quarter, it appears that 217,906 tons of quartz yielded 93,824½ ozs. of gold, or at the rate of 8 dwts. 14⅝ grs. per ton; 9709 tons of quartz tailings and mullock yielded 764⅛ ozs. gold, or 1 dwt. 14 grs. nearly per ton; and 1448 tons of pyrites and blanketings yielded 3105⅜ ozs. of gold, or 2 ozs. 2 dwts. 21⅝ grs. per ton. The reports of the surveyors and registrar as to the progress of mining are, on the whole, more favourable, most districts showing a satisfactory revival. The appendix contains a page of letter press and accompanying lithogram on araucaria johnstonii, being continuation of Observations on New Vegetable Fossils of the Auriferous Drift, by Baron F. von Müller, K.C.M.G., F.R.S., &c., Government botanist.

VICTORIAN YEAR BOOK.—The sixth annual issue—that for 1878-9—of the official Victorian Year Book has just reached this country (Melbourne: Ferres. London: Robertson, Warwick-square), and contains as usual a vast amount of information of paramount importance to all connected or having business with the colony. Mr. H. H. HAYTER, Government Statist of Victoria, has already been congratulated upon the utility and completeness of his volume, and the present year book is even more exhaustive than its predecessors. The population now reaches about 880,000, and there is good evidence of fair general prosperity. During 1878 the Government received 45,470*l.* as succession duty, this duty being levied in a peculiar manner—when the property, real and personal, of the deceased is under 1000*l.* the duty is 1 per cent.; when under 5000*l.* it is 2 per cent.; and when under 10,000*l.* it is 3 per cent., the percentage increasing until estates of 100,000*l.* and upwards pay 10 per cent. Half duty only is paid by widows, children, or grandchildren. Drunkenness is slightly on the increase, but taking crime generally South Australia is alone less criminal than Victoria of all the Australian colonies. With regard to the manufactories and works, they have nearly doubled in ten years, and the value of the land, buildings, machinery, and plant used in connection with them has more than doubled. The entire volume will well repay study.

LINKAGES.—Although many have no doubt heard of the Peaucellier cell and of Leonardo da Vinci's mechanism, there are probably few who have any large appreciation of their utility or application, so that the little volume of Van Nostrand's Science Series—Linkages: the Different Forms and Uses of Articulated Links, by J. D. C. de Roos—which may be described as a popular treatise on the former invention, will be generally acceptable. The treatise, of which the present is a translation, originally appeared in the Revue Universelle des Mines; and in its present form will, without doubt, be extensively studied both in technical and in the higher general schools. Much information upon the subject is to be found scattered over the mathematical and engineering literature of England and the Continent, but the gist of this is for the first time brought together in the present volume (New York: Van Nostrand. London: Trübner and Co., Ludgate Hill). Some applications of the Peaucellier cell to mechanism have secured attention and approbation in a new quarter, and it seems now that a new demand may stimulate new enquiry, and lead to further valuable discovery, although the usefulness of the original cell has not yet been fully made known. In 1864 Peaucellier, a French officer of Engineers, proposed in the Nouv. Ann. de Mathématiques the problem of the transformation from circular to alternating rectilinear motion by means of articulated rods, and in 1873 he furnished the solution in the same Journal. Peaucellier's apparatus consisted essentially of four equal rods or links forming an articulated rhombus, but the name is more particularly applied to an arrangement in which the four links are pivoted at the extremities in such manner as to be movable in the plane of the figure, whilst the alternate angles are also united by links to the axis of rotation. The remarkable properties of the Peaucellier cell depend upon the simple relations existing between the arms or links. The invention is alike applicable to the delineation of curves of every kind, and also to the making of various calculations; and although further discovery will no doubt lead to certain simplifications, it is in its present form extremely valuable. The volume treats the subject lucidly and exhaustively, and is amply illustrated.

SOLID AND BRACED ELASTIC ARCHES.—The thoroughly practical treatises on voussoir arches and framed bridges, by Mr. WILLIAM CAIN, C.E., published from time to time in Van Nostrand's Science Series, have been noticed in the *Mining Journal* as they appeared, and he now contributes a not less useful treatise on the Theory of Solid and Braced Elastic Arches applied to Arch Bridges and Roofs in Iron, Wood, Concrete, or other material (New York: Van Nostrand. London: Trübner and Co., Ludgate-hill), which will be of special interest to students of graphical analysis. It is remarked that the analytical treatment of solid and braced arches is very complex, and does not admit of the same generality in the deductions as the graphical method. As Mr. Cain assumes only an elementary knowledge of statics and of the theory of elasticity, the treatise will be valuable to the largest possible number of readers. As the methods given apply to any style of arch loaded in any manner, the utility of the book cannot be doubted, and Mr. Cain is certainly entitled to claim that the treatment is the first thorough and general one. The volume is one that cannot be studied without acquiring a thorough mastery of the subject.

STEEL—ITS HISTORY, MANUFACTURE, PROPERTIES, AND USES.—The literature of steel metallurgy has now become so extensive that it is scarcely reasonable to expect that any manufacturer with all the hurry and troubles of business could hope to keep himself posted, and hence it is that such compilations as that of Mr. J. S. Jeans, the able secretary of the Iron and Steel Institute (London: Spon, Charing Cross) are as extensively read as they are invaluable. From the authorities quoted it is evident that Mr. Jeans has carried his researches to the metallurgical works of France and Germany, as well as of this country, and if he has been unable to compress his notes into less than 860 pages, it will be concluded before many pages are read that this is not the result of want of conciseness, but arises from the almost innumerable number of facts recorded. The volume embraces sixteen chapters on the history of steel, six on its manufacture, two on its properties, and seven on its uses, the whole being so arranged that any information required can be found almost as readily as an article in an encyclopædia. Nearly a hundred authorities are quoted in the volume, which, moreover, is illustrated with 24 plates, and almost innumerable wood engravings. To attempt to epitomise a volume of this character would be out of the question, but it is only just to say that in preparing it the author has entitled himself to the congratulations of all connected with the manufacture or use of iron and steel, and there is no doubt that it will enjoy a wide and extensive circulation.

Mr. CROOKES, F.R.S.—An extraordinary prize of 3000 frs. has been awarded by the French Académie des Sciences to Mr. Crookes, F.R.S., in recognition of his recent discoveries in molecular physic and radiant matter.

IMPROVED ZINC AND METAL ROOFING.—The method of fixing metallic roofing without nails or solder adopted by Messrs. QUINCET, VINCENT, and LEVINSTEIN, greatly facilitates placing or removing the metal for the purpose of examining the state of the timbers when required, and at the same time gives the metal absolute freedom of expansion or contraction. On the ordinary rafters flat copper hooks are screwed by copper screws or nails (tinned or not), and which receive the ends of the sheets of zinc or other metal; these sheets pass under the upper series of hooks and rest in those below. The necessary play for the insertion or removal of the sheets being also sufficient for the expansion or contraction of the metal. The sides of the sheets are bent, and pass up the sides of the raised ribs or ridges of the roof, and the edges of the metal sheets here presented are capped or covered with metal, secured in a similar manner to that described for the sheets, that is by hooks; and the form of this part of the roofing is such as to resist snow, dust, or the effects of the strongest winds. These sheets are of the width commercially understood, and of the length desired. All the lower sheets of the roofing are fastened by hooks screwed or nailed to the ribs, and they are all bent to protect the woodwork, and lock or hook together. The edge sheets are rolled and fastened by their coil. The capping or covering the sides of the bent up sheets is of such a section as to resist capillary attraction, and all the caps have what may be termed heels, which are closed by solder, and enclose the ends or junction of the metal sheets.

HOLLOWAY'S PILLS AND OINTMENT.—The great vicissitudes of temperature, the fogs, and the foul vapours which permeate the atmosphere try the respiratory channels terribly; hence arise hoarseness, quincies, loss of voice, bronchitis, and the whole train and endless variety of throat and chest affections which now prevail. Neglect of these in their early stages is almost criminal, as many a life might be saved by early and prompt treatment by means of Holloway's well-known remedies. This treatment can be readily and easily carried out, and soon disposes of the attack in a most satisfactory manner by restoring the balance between the circulation and respiration, by lessening the inflammation, abating the febrile symptoms, and by soothing the irritability of nerves.

THE MINERAL RESOURCES OF EASTERN NEVADA—No. II.

THE RICHMOND CONSOLIDATED MINES.

In describing so great a mine as the Richmond it is but just to pay a tribute to a management that has so successfully controlled and operated one of the greatest precious metal producing properties in the world, and one that has been a main factor in the prosperity and advance of Eureka. The resident manager, Mr. E. Probert, is a gentleman of decided genius and marked talent, and the history of the property since he has been in charge has been one of constant progress both in the growth and application of economical processes, and those that have not only cheapened the cost but have also increased the capacity of the works in every department. In smelting and refining he has plaeed the Richmond Works at the head of the list, no others in the world comparing with them in efficiency. In this he has been ably seconded by Superintendent R. Rickard, a gentleman of superior executive mining ability, and one who is thoroughly conversant with the treatment of lead ores and the reducing and separating operations. The assistant-superintendent, Mr. N. Westcoatt, a mining engineer of wide experience and one of the most competent civil engineers on the coast, gives his time and attention to the mine, and has been found to be the right man in the right place.

The early technical history of the mine can be readily gathered from the State Mineralogist's report for 1873-4. The vein cropped out on the south-west side of the hill, and it has been followed about 900 ft. on the dip to the north-east or opposite slope—the workings passing below the crest of the hill at a depth of 300 ft. or thereabouts. On the north-eastern slope a shaft has been sunk (now 500 ft. deep), from which two drifts have been run—one at 200 ft. and the other at 400 ft., and each about 250 ft. long—to the ore body. This has been found to preserve nearly the same course and dip at the greatest depth attained as it possessed at the starting point on the other side of the hill. It has been technically defined as a "pipe vein," but it is made up in reality of a series of bonanzas of an ellipsoidal shape; placed with their longer axis in the direction of the dip. One of these, the third from the croppings, and the largest, extends downwards about 300 ft.; its greatest lateral extension being about 250 ft., and its maximum thickness 100 ft. This chamber is invaded at two or three points by projecting buttresses of limestone, diminishing the mass of ore by at least one-third The ore itself consists chiefly of an argentiferous carbonate of lead, having nodules of galena interspersed through it, as well as a large amount of decomposed arsenical pyrites, which is gold bearing. Large masses of oxide of iron alternate with the richer vein material, and constitute what may be termed the "gangue," which imparts to the ore its usual ferruginous or red-earthy appearance. This oxide of iron, which amounts to over 40 per cent. of the contents of the vein, is itself more or less rich in gold and silver, and forms, with the other materials, an excellent fluxing mixture.

Practically, indeed, the ore has no "gangue," and all that can be done in the way of assorting is to remove some of the poorest looking lumps of ironstone and any pieces of limestone which may have fallen into the vein from the hanging-wall. The carbonates of lead vary in colour from dirty white to yellow grey and a dull earthy red, the latter alone being due to an admixture of iron oxides. Some rarer minerals are also found in the mine; such as mimetite, which is an arseniate of lead combined with chloride of lead, and is always rich in gold; also, lining the drusy cavities of the harder vein materials, there are often met with beautiful crystals of molybdate of lead of the usual tabular form and orange colour. An analysis of the ore shows that the percentage of oxide of iron is very high, and to this is due the simplicity and success of the smelting process. The constituents are—oxide of lead, 26·57 (=24·65 lead); oxide of copper, ·52; Peroxide of iron, 40·37; oxide of zinc, 2·46; arsenic acid, 5·82 (=3·79 arsenic); antimony, traces; sulphuric acid, 2·60 (=1·40 sulphur); chlorine, traces; silica, 7·08; alumina, ·77; lime, 1·18; magnesia, ·50; water and carbonic acid, 12·60 = 100·47, whilst the more valuable part of the ore consists of 30 ozs. 1 dwt. of silver and 19 dwts. 14 grs. to the English ton.

In 1871 the property was sold to the Richmond Consolidated Mining Company (Limited). For reasons of policy the property was in 1876 conveyed to, and is still owned and worked by, the Richmond Company of Nevada, a corporation constituted according to the laws of the State of Nevada. This company has, since its formation, acquired by purchase and location numerous other mining claims, and is now the owner of the following, among other locations, some patented and others unpatented. Richmond (patented), Virginia, Colorado, Tip Top (patented), Look-Out (patented), Victoria (patented), Silver Region (patented), Great Eastern (patented), Grand Central (patented), St. George (patented), Cyrus, Rearguard, St. David, St. Patrick, St. Andrew, Lucky Man, Ravine, Cliff, Utah, Arctic, Atlantic, Antartic, Standard. At no time since the formation of the company has the mine been without ore in sufficient quantity to keep the furnaces in operation. From September, 1871, to Nov. 30, 1879, 236,605 tons of ore have been extracted and smelted at the company's works. Besides the company's ore, 20,360 tons of purchase or custom ore have been smelted—making a total of 256,065 tons.

The company's smelting and separating works are situated in the town of Eureka. The first furnace was erected in 1871, by Ogden, Dunn, and Co., and when the present company acquired the property two additional furnaces were built. The capacity of these furnaces was from 35 to 45 tons. In 1875 three hydrocyles (water-jacket furnaces) were erected, of a capacity of from 30 to 40 tons. In September, 1878, the company's works were entirely destroyed by fire, and in their place new works on an improved plan were constructed, consisting of four furnaces, two of which have an average capacity of 90 tons daily, one of 70 and one of 50 tons. All the furnaces as now constructed are of the hydrocycle type, which is found much more economical in construction and operation. The bullion produced from September, 1871, to Nov. 30, 1879, was 42,402 tons, of the value for gold and silver of 2,699,424*l*. Owing to the heavy freights the lead contained in the base bullion is of little or no value. This is not true, however, of refined lead, such as that produced at the Richmond Refinery, and a close estimate places its value at 700,000*l*., making a grand total of 3,399,424*l*

The Richmond Company has since 1874 refined its own furnace product or base bullion (so-called) instead of sending it to New York, as in former years, and has found an advantage in so doing. The process in use at its works is that invented and patented by Messrs. Luce and Rosan, of Marseilles, France, which may be described as a process of desilverisation by steam. In principle it is a crystallising process, and essentially the same as the well-known Pattinson process, but quickened tenfold and relieved of the severe manual labour involved in the working of that process by the use of steam Under a pressure of four atmospheres steam is introduced into the bath of melted lead by means of a tube entering the bottom of the 50-ton cast-iron crystallising pot containing the charge, whence it rises through the hot lead, causing a violent agitation of the metal, while at the same time a slender stream of cold water is allowed to fall on the surface of the liquid mass to assist in cooling it. The temperature gradually falls, and crystillisation commences under these influences, and in the course of half-an-hour fully two-thirds of the original 50 tons of silver-lead alloy will by found to have assumed a dry, semi-crystalline, or sandy appearance, the crystals containing much less silver than the original alloy, while the remaining third part will be found in a liquid state in the bottom of the pot, whence it is tapped out into 4-ton moulds set in the floor, and allowed to cool.

The 4-ton blocks of cooled lead are lifted out of the moulds by steam cranes and placed in melting pots, arranged in pairs near the crystalising pot, into which the blocks when melted are run, to be again crystallised and parted into poor and enriched lead. This process is repeated till finally soft market lead, almost free from silver, is obtained on the one hand, and on the other a silver-lead alloy, rich enough to be cupelled, containing from 500 to 600 ozs. of silver per ton. No zinc is used in this process. The lead produced is very soft and pure, while the loss of the precious metals, as well as of the lead itself, is much smaller than in any of the zinc processes usually employed for desilverising. The company's refining establishment, as now constituted, consists of four 40-ton calcining pans, for softening the lead previous to crystallising; four crystallising apparatuses, or batteries, each consisting of a crystallising pot, flanked by two melting pots; three steam cranes, or derricks, for lifting the blocks of lead about; five cupels, for reducing the rich alloy obtained from the crystallisers; and two reverberatory furnaces for reducing drosses. The establishment, working to its full capacity, is capable of turning out between 50 and 60 tons of market lead daily.

FOREIGN MINING AND METALLURGY.

As regards the Belgian iron trade it may be observed that the basis price adopted for merchants' iron at Liége is 9*l*. 12s. per ton. As regards orders on the part of the Government there is no news to communicate. The Government contents itself with circulating favourable reports, and does nothing further.

In the Belgian coal trade prices remain very firm, and show a tendency to advance rather than otherwise. Mons coal for sugar-works is quoted at 11s. 3d. per ton; that price would probably advance if French competition did not keep it at this level. The rise in coal has been less rapid in France than in England or Germany; but it now exhibits a tendency to become more decided. In the Liége basin coking coal is quoted at 11s. 3d. to 12s. per ton, and coke at 1*l*. 4s. per ton. There are great complaints as to the inadequacy of the supply of rolling stock on the Belgian railways. The production of co l in Bohemia in 1879 is returned at 4,889,000 tons, as compared with 4,304,290 tons in 1878.

The French coal trade has shown rather less activity. Coal for domestic consumption still comes to hand at Paris with some difficulty, navigations having scarcely regained their ordinary course. In the Nord and the Pas-de-Calais there is no more activity than there should be. There are plenty of orders, but they are executed with difficulty, in consequence of the inadequacy of the means of transport in existence. There are, of course, many complaints on this head. In the basin of the Centre the situation is much the same. The extraction of coal in the department of the Nord in 1879 amounted to 3,167,121 tons, as compared with 3,240,004 tons in 1878, showing a diminution of 72,683 tons last year. The production of the Anzin mines in 1879 amounted to 2,006,516 tons, or 79,044 tons less than in 1878. The production of the Escarpelle mines also declined last year 23,657 tons. On the other hand, the Auiale mines produced 26,240 tons more last year. The production of coal in the Pas-de-Calais last year amounted to 4,171,800 tons, against 3,829,851 tons in 1878, showing an increase of 344,949 tons last year.

The upward movement in prices which has been noted of late in the German iron trade does not appear to have been stopped for the present. Iron in bars has advanced 10s. per ton during the last few days. Pig has also advanced in price, and it has further become so scarce that several ironworks have found it necessary to order supplies from England. Efforts are being actively made to enable the works to meet the demand for pig in future, and repairs are being pressed forward at various blast-furnaces in Lorraine as well as in the Siegn district and in the Luxembourg. The Vulcan blast-furnaces near Duisbourg are also being repaired, and two of them are to be lighted immediately. The Cologne and Minden Railway has just reduced its tariff for the conveyance of coal and iron minerals for Holland and the Belgian provinces, accommodated by the Great Central Belgian Railway. A commission appointed to revise the Russian tariff system recommends the abolition of the duties at present charged on pig-iron imported into Russia.

In the French department of the Haute-Marne the forges are now carrying on working operations with full vigour, and they have some difficulty in completing deliveries. The new quotations are now generally accepted. Iron from coke-made pig is quoted at 9*l*. 12s. to 10*l*. per ton, and mixed iron 8*l*. to 8*l*. 8s. per ton In the Ardennes prices may be said to have been constantly advancing for more than a month past. At the commencement of 1880, 8*l*. per ton was the general quotation for iron, but now the price has been carried to 9*l*. 12s. per ton. In the Nord certain works have carried the price of ordinary iron to 9*l*. 12s. per ton, while other descriptions have made as much as 10*l*. per ton.

ENDLESS-CHAIN MINE RAILWAY AT FILLOLS.*

The iron mines at Fillols, in the Canigou region, Eastern Pyrenees, are situated at a high elevation, from which the minerals are conveyed by gravitation, in small wagons on a double line of railway, with endless chains. The system extends over a distance of 5 miles in direct length, between the highest point, called Salvé, and the station at Prades. The undulations of the surface are followed, for the most part, though here and there holes are filled up, and humps are removed. The railway consists of seven inclined planes, on which two lines of way are laid to a gauge of 21⅝ in. between the centres of the rails. The rails are of Bessemer steel, 14 lbs. per yard, fish-jointed, and laid on transverse sleepers, 30 in. apart. The difference of level at the mine and Prades station amounts to 984 ft. The inclines, direct and reverse, vary from a level to 23 per cent., or nearly 1 in 4; they are connected by short pieces of level line. A directing pulley is placed at the end of each incline, and the system is automatic; as the loaded wagons, descending by gravitation, draw up the empty wagons. Each wagon weighs 500 lbs., and carries a load of ½ ton. The speed is limited to 3·35 miles per hour, at which rate 300,000 tons per year can be transported. The wagons are controlled by means of four brakes with return pulleys.

The chains consist of ring-links, and weigh from 8 lbs. to 20 lbs. per yard, according to the maximum degree of tension on the different planes. The chain is supported on the wagons, and is attached to each wagon by a fork, between the sides of which one of the links enters. The chain is thus entirely supported by the wagons, and is suspended or floated *(chaine flottante)*. The loaded wagons leave the chain at a distance of a few yards before the pulley, which is raised sufficiently high to lift the chain out of the fork, and arrive quietly on tables. The wagons are pushed on down a slight incline to take the next length of chain, or if it be removed at this platform, are turned aside and replaced by empty wagons.

The first cost of the floating chain system of transport amounted to 1276*l*. per mile. The cost for transport varied from ¾d. to 2½d. per ton conveyed per mile. The cost for the whole distance, 5 miles, taken at 2½d. per mile, amounts to 1s. 3d. per ton; whilst formerly the cost for conveyance by oxen amounted to 3s. 3d. per ton.

— By A. EVRARD: Résumé de la Société des Ingenieurs Civils.

* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions and Periodicals," for the Proceedings of the Institution of Civil Engineers.

MANUFACTURE OF STEEL.—An improved process for manufacturing a high quality of steel or ingot iron by a combination of the Bessemer and open hearth process from pig containing much phosphorus, or phosphorus and sulphur, has been patented by Mr. E. P. Martin, of Blaenavon. He blows the molten pig in either a vertical or tipping Bessemer or other converter, with an ordinary silicious lining till nearly all the silicon is removed. He prefers to stop the blow two or three minutes before the drop of the flame. He then runs the metal (without the slag) either directly through a runner, or by the intervention of a lade, into a Siemens, Pernot, or other open hearth furnace (preferably a Pernot or other rotating gas furnace). This open hearth furnace must be lined with basic material (preferably Thomas's magnesian lime bricks), and have spread on its hearth a large quantity of limestone or of lime, which he always prefers to mix with a large quantity (preferably an equal weight) of oxide of iron, so as to produce a highly basic calcareous slag, which may advantageously contain over 40 per cent. of lime and magnesia. By the action of these bases the phosphorus and a considerable amount of the sulphur are rapidly removed. The greater the agitation the more rapid will be the dephosphorisation. When the charge has been brought to the desired pitch, as indicated by the fracture of a sample showing the phosphorus to be removed, the slag is tapped off before the spiegel or ferro-manganese is introduced. A part of the charge in the open hearth furnace may consist of scrap iron. A very high quality of steel may be thus produced from the cheapest materials. Mr. Martin claims not the mere dephosphorising by basic additions, but the improved combined process described for the manufacture of steel from phosphoric pig-iron.

FOREIGN MINES.

COLORADO UNITED.—Extract from manager's letter: Taken all through, the Terrible Silver Ore Mine looks very promising, our great difficulty during the past year has been want of reserve ground. During the coming year (1880) I am very confident the mine will gain a very large reserve, and the system of stoping away ground as fast as it is opened by drifts and winzes can be avoided.—Silver Ore Tunnel: During the driving of the 100 ft. just finished nothing of importance was encountered, but small seams of mineral of rich quality not sufficient size to warrant the driving of any levels on them. I have suspended the tunnel for the present with regret, as I believe that within the next 100 ft. we would cut a large lode. I am working at the accounts of October, November, and December, 1879, and hope to have them completed and off in less than one week.

SANTA BARBARA (Gold).—Thos. Tregellas, Pari, Jan. 16: During December 1047 tons of mineral were stamped, producing 5093 oits. of gold, and 153 oits. obtained from the additional strakes recently erected, giving a total produce for the month of 5246 oits. of gold, or equivalent to 5·010 oits. per ton of stone stamped. This produce of 5246 oits., valued at 8s. 6d. per oitava, amounts to 2229*l*. 11s.; and the estimated working cost for the month at exchange 22½d. being 1104*l*. 0s. 7d., leaves an estimated profit at the mine of 1125*l*. 10s. 5d. Mr. Tregellas reports that the operations during the month of December had been confined to sinking No. 1 shaft and quarrying the Nos. 6 and 7 stopes south, and the No. 7 stope north, where the lode continued to maintain its size and auriferous quality. Of the gold obtained from the refuse sand 123 oits. came from the additional strakes at the No. 5 stamping mill and 30 oits. from the additional strakes at the amalgamating machinery worked by No. 1 stamping mill. The mine force had been ample for the requirements of the establishment during December, and it could be increased if necessary; the hauling power had not, however, been able to draw more stone to surface than had been raised during the month. The mine captain reports as follows for December:—The quantity of ore raised during the month amounted to 1308 tons, of which 261 tons were rejected as refuse stone and 1047 tons treated at the stamps. Average quantity of ore raised per borer for the month 29·34 tons, or per hole bored 0·559 ton.

RUBY AND DUNDERBERG.—Eureka, Nov. 31: Dunderberg: The 500 south from shaft has been connected with the winze from the 400, and the men are, at the present moment, employed in the process of putting in a "chube," and as soon as this is completed a cross-cut will be started from the 400 in a westerly direction, to explore the ground under the Home Ticket workings. About 15 ft. north of the winze on the 500 level a small bunch of ore was encountered, and two men are now rising on it. The intermediate drift has been advanced since last report 21 ft.: total, 137 ft. In the present end the seam of ore is very narrow, but the fissure is well defined and regular.—Home Ticket: On this claim eight men are at work extracting ore; in the present end there is a very nice vein of ore varying in size from 2 to 4 ft. wide, and of good quality. There is a very good showing, and it is below any point in any of the main workings of the old Home Ticket incline.—Bullwhacker: There are four men employed in extracting ore, and there is not much change since last week; the lode is about 2 ft. wide. Nothing new to report in any other part of the workings.

CONNOLLY (Nevada).—J. Potter, Jan. 26: Nothing of importance to report on the mine since my last letter; all the workings are looking equally well, and an average amount of ore being extracted and piled up in the levels; we have ample room to store away a large quantity, and arrange so that a good shipment can be made for next sampling, which I presume will not be till next month.—Upper Works: In these works a vein of very nice quartz is now being worked on; it carries about 18 in. of pay ore, and the material is very hard blasting ground, hence the process of extracting is very slow.—180 Feet: The men operating at this point have decided to stop further prospecting for the present, and propose to commence sinking on the ledge from the old ore chamber at the end of the adit level with a view of picking up and connecting with the upper ore body on the dip.—230 Feet: The vein here is not so large as it has been, but the increased value of the material more than compensates for the contraction.—North Winze: The extent of this deposit lately struck has not yet been ascertained; the prospects are flattering, and every indication of the body opening out extensively.

EBERHARDT AND AURORA.—Extracts from Capt. Drake's letters, Jan. 21: "I am pleased to be able to state that our prospects in the Eberhardt and Aurora Tunnel have greatly improved during the past 30 days, The last 100 ft. of ground through which we have driven the tunnel I think fully demonstrates the fact that there is ore at great depth in Treasure Hill, and that the marvellous rich ores which have been found and extracted from near the surface of our mines is but a proportion of that which lies at greater depths. The progress for the past year has been all that could have been expected from the character of the ground through which the tunnel has been driven. The main tunnel has been advanced 981 ft., making the total distance driven to Jan. 1, 4823 ft. Total distance driven in Eberhardt drift, 1077 ft.; total distance driven in Upraise drift, 72 ft., making the total number of feet driven in 1879, 2130 ft.

— Jan. 26: You will observe the location of the 20th inst. was made at a point 4875 ft. from the mouth of the tunnel, and by the survey made by Mr. D. J. Read at the time the tunnel was commenced the distance to the South Aurora line is 4907 ft., thus leaving 32 ft. of the Eberhardt and Aurora No. 2 claim upon our ground. Our company will have the first 32 ft. (provided the present line is correct), then the South Aurora Company will have the following 800 ft. running to their northern line, and the balance of 668 ft. will belong to our company. I consider the coming upon ore in our tunnel to be of great importance both to our company and the South Aurora. To give you an idea how we first found this quartz, I beg to say it first made its appearance on the west side of the spar vein, which we passed through on about the 8th inst. The spar vein came in upon the east side of the tunnel, and its course is a few degrees west of the line of the tunnel, consequently we passed diagonally through it. It is a difficult matter to state the exact average width of the ledge matter, for at the point we are driving at the present time the same material exists as that in which we find ore in the N. A. and W. B. mines. I think the ore body lies to the west of us; there should be a joint survey made, and have the south end line of the South Aurora patent established, and until this point is fixed I cannot give the actual distance run in this ground. I would be pleased for our directors to call the attention of the South Aurora Company to this important fact, and advise me how to proceed, and also to receive the expression of the board upon this matter.

— Frank Drake, Nevada, Jan. 26: Progress report for week ending Jan. 24: Eberhardt and Aurora Tunnel: Distance run to Jan. 17, 4909 ft.; run for week ending Jan. 24, 35 ft.; run for month of January, 121 ft.; total distance run to Jan. 24, 4944 ft.—Remarks: The ground is very hard and breaks bad; it consists of lime and spar, and from some cause the air is bad, but we hope to overcome this difficulty soon. We have passed through the quartz, leaving it to the west of us.

CAPE COPPER.—OOKIEP—Capt. Lanksbury and Capt. Henwood, Dec. 31: We continue to make good progress in sinking the new shaft below the 68 fathom level. The ground in the bottom has fallen off a little in value, now worth 4 tons of copper ore per cubic fathom. The 92 north from the eastern extremity having become unproductive we have suspended it, and put the men to resume the driving of the 92 east from under new shaft. The stope in the back of the 92, north-east of No. 28 winze, produces 3 tons of copper ore per fathom. The 80 north in the eastern extremity being communicated with new shaft we purpose to drive east from this point in a few days, in ground worth 6 tons of copper ore per fm. The ground in the 80, north-east of No. 31 winze, has declined a little in value. The present forebreast yields 6 tons of copper ore per fathom. The 68, east from new shaft, shows a little improvement. The present end is worth 1 ton of copper ore per fathom. The 60, east of No. 32 winze, still produces 5 tons of copper ore per fathom. This driving is opening out a good piece of stoping ground in this direction. In the 60, south-east of No. 32 winze, the ground is somewhat disordered and very changeable. The present end is worth 2 tons of copper ore per fathom. The ground in the 58, south-east of No. 18 winze, is rather poor, producing only a few stones of copper ore, not sufficient to value. The 58, south-west of shaft, is still in massive quartz. The stopes throughout the mine continue to look well.

SPECTAKEL.—Capt. Lanksbury, Capt. Henwood, Dec. 25: There is no change worthy of remark in the incline below the 53; the sinking is progressing favourably. The 64 east of winze has been suspended, partly in consequence of the hardness of the ground, but more especially until communication is effected with the incline, when this level will be better ventilated, and offer greater facilities for making further trials. The ground in the 64, north of winze towards incline, presents good indications, but has not yet met with anything of value. The 53, east of No. 2 flookan course, continues to yield a little copper ore, and the favourable appearance of the rock induces us to drive a little further in this direction. The stope in the bottom of the 53 maintains its value of 3 tons of copper ore per fathom.

NABABEEP MINE.—Capt. Lanksbury, Capt. Henwood, Dec. 31: The stope in the back of the 28 is producing a large quantity of stuff of a low percentage. The 17 east from old shaft is now being rapidly pushed on; the ground has a promising appearance, and producing spots of copper ore.

RETURNS.—For December, Ookiep, 1075 tons of 30 per cent.; Spectakel, 60 tons of 34 per cent.—Bills of Lading received: 690 tons per Glenudal, 550 tons per Ocean King, and 380 tons per Penwith.—Arrivals at Port Nolloth: The Gleam and Galatea.—Arrivals at Swansea: The San Jose, Ogmore, and L'Espérance.—Sales during January: 608 tons at 13s. 11¾d., 750 tons at 13s. 8d., 600 tons at 14s., 150 tons at 14s. 3d., and 65 tons at 15s, per unit; and for February delivery, 600 tons at 14s. 9d., and 200 tons at 15s. 3d. per unit.

[For remainder of Foreign Mines see to-day's Journal.]

THE MINES COMMISSION.—Prof. Tyndall is continuing his active interest in the work of the Accidents in Mines Commission, of which he is a member. The enquiry of the Comission is limited to accidents, and inasmuch as accidents are mainly the result of explosion, the question to be considered is chiefly of lighting, and upon this point it is understood that Prof. Tyndall, is hopeful of being able to introduce the electric light under incombustible conditions. Experiments are being made which lead to the supposition that success will be attained. But although an electric light which would neither need nor afford the means of ignition must offer conditions of security which have not hitherto been attained, it is, of course, acknowledged that there is and must always be a margin for accident in which carelessness, mischief, and misadventure will have free play.

EPPS'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette*.—Sold only in packets labelled—"JAMES EPPS and Co., Homœopathic Chemists, London."

PARIS EXHIBITION, 1878.

GOLD AND SILVER MEDALS AWARDED for Steam-Engines & Boilers, also the Special Steam Pump, and Compound Pumping Engine.

TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,

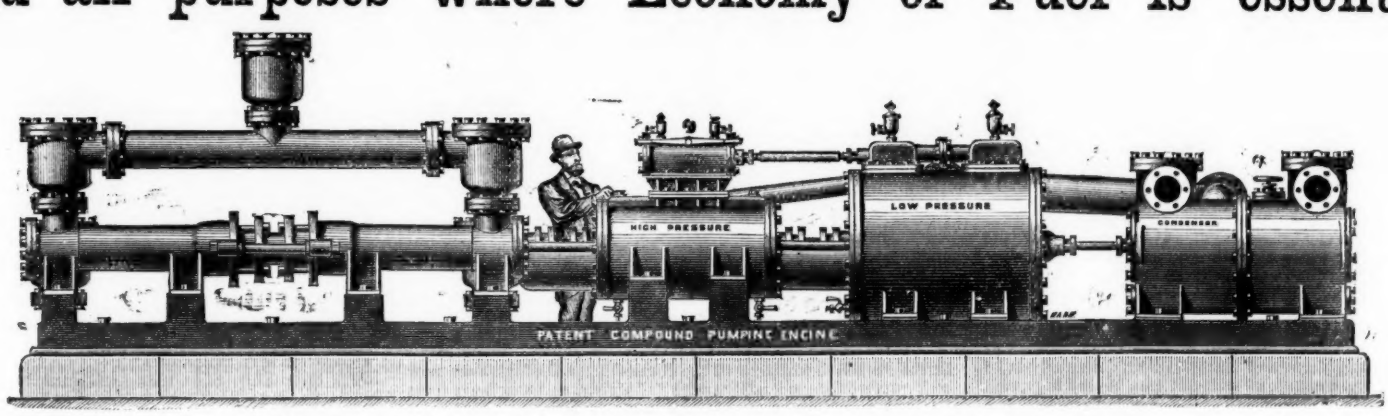
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

TANGYE'S DIRECT-ACTING

COMPOUND PUMPING ENGINE,

For use in Mines, Water Works, Sewage Works,

And all purposes where Economy of Fuel is essential.



TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE, WITH AIR-PUMP CONDENSER.

TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine :—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

$\frac{21"}{36}$ Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.

$\frac{21"}{36} \times 10" \times 48"$ COMPOUND CONDENSING STEAM PUMPING ENGINE.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Vale. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station. Yours respectfully,

(Signed) JOHN R. FORSTER, Engineer.

The Chesterfield and Boythorpe Colliery Company (Limited), Registered Office, Boythorpe, near Chesterfield, Oct. 1, 1879.

$\frac{21"}{36} \times 12" \times 48"$ DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

Messrs. Tangye Brothers. Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute=224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition. Yours truly,

(Signed) M. STRAW, Manager.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.		8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder .....In.		14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder .....In.		4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke .....In.		24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate		3900	6100	8800	6100	8800	12.000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing...	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto	ditto—with Holman's Condenser...	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto	ditto—with Air-pump Condenser...	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder .....In.		16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder .....In.		28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder .....In.		8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke .....In.		36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate		15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,050	35,225	47,950
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing..	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562	
Ditto ditto	ditto—with Holman's Condenser...	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	
Ditto ditto	ditto—with Air-pump Condenser...	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

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TWO GOLD MEDALS.

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The LEEDS FORGE CO., Ltd.,
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FOX'S PATENT
CORRUGATED FURNACE FLUES,

NOW APPLIED TO OVER

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PARIS, 1878.

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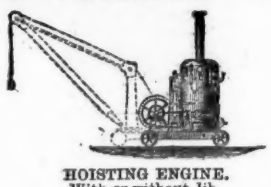
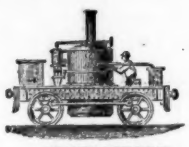
CHAPLIN'S PATENT PORTABLE STEAM ENGINES AND BOILERS.

STATIONARY ENGINE. No Building required.



HOISTING ENGINE. With or without Jib.

*STEAM CRANE. For Wharf or Rail.



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SHIPS' ENGINE AND DISTILLER.

PUMPING AND WINDING ENGINE.

* *These Cranes were selected by H.M. Commissioners to receive and send away the Heavy Machinery in the International Exhibitions* 1862, 1871, *and* 1872.

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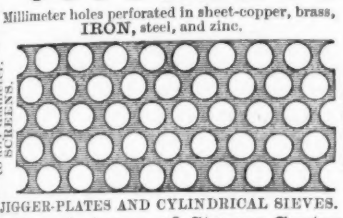
Millimeter holes perforated in sheet-copper, brass, IRON, steel, and zinc.

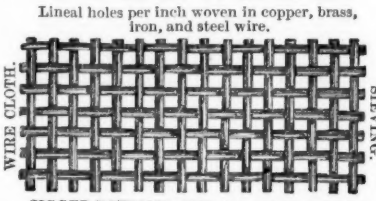


GRATINGS. SCREENS.

JIGGER-PLATES AND CYLINDRICAL SIEVES.

CERTIFICATE OF MERIT
Awarded by the Mining Institute of Cornwall for SIEVES AND GRATES, Shown at the Annual Exhibition, 1879.

Lineal holes per inch woven in copper, brass, iron, and steel wire.



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JIGGER-BOTTOMS AND CRUSHER SIEVES.

Manufacturers of Stamps-Grates, Sieves, and Riddles, for Mining and other purposes, by Self-acting Steam Machinery.

SPECIALITY.—Thick Copper, Brass, Zinc, and IRON Perforations, Classifying-Sieves, Pierced Pulveriser and Stamps-Grates up to 289 holes to the square inch, Copper-bottom "Tinsifts" and Hair-bottom "Delewering-serges."

MINING AND COLLIERY TOOLS.

Picks, Shovels, Rakes, Riddles, Skips, Blowing Tools, Pit Tubs, Crucible Cast Steel Wheels and Axles, Tram Nails, Bolts and Nuts, Washers, Wagon Wheels and Axles, Springs, Chains and Traces, Harness, Files, Lifting Jacks, Crabs, Cranes, Pulley Blocks, Pit and other Rails, Screen Bars, Air Pipes, Brattice Cloth, Gas Steam and Water Pipes, Loco Tubes, Smiths' Hearths complete, Smiths' Tools, Powder Magazines and Safes, Wire and Hemp Ropes, Pit Tub and Wagon Ironwork of every description.

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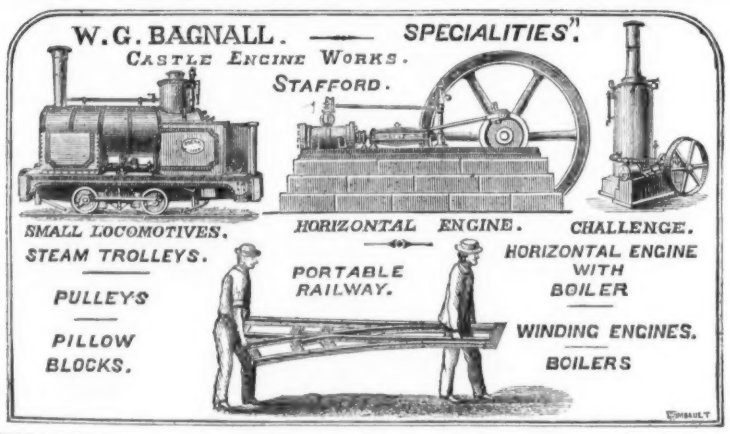

INCREASED VALUE OF WATER-POWER.

MacADAM'S VARIABLE TURBINE.

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

References to places where it is at work will be given on application to—

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PHOSPHOR BRONZE COMPANY LIMITED — TRADE MARK

PHOSPHOR BRONZE.

REGISTERED TRADE MARKS.

THE BEST METAL FOR
BEARINGS, SLIDE VALVES, PUMPS,
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WIRE, SHEETS, TUBES, &c.

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SUMNER and EMERSON STREETS, SOUTHWARK, LONDON, S.E.

SOLID DRAWN BRASS AND COPPER BOILER TUBES,

FOR LOCOMOTIVE OR MARINE BOILERS, EITHER
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MUNTZ'S METAL COMPANY (LIMITED),
FRENCH WALLS,
NEAR BIRMINGHAM.

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FOR EVERY DESCRIPTION OF PLANT FOR
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MANUFACTURERS OF
High-class Varnishes and Japan,
For COACH & RAILWAY WAGON BUILDER
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Lists and Samples on application.

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STEEL TRAMS AND TIPPING TRUCKS.

STEEL (OR IRON) TRAMS AND TIPPING TRUCKS. Patented in Europe, America, and British South Africa Lightest and strongest made.

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GILDERSOME FOUNDRY, NEAR LEEDS.

THE GRAND PRIZE, THE TRIPLE AWARD,

Gold Medal, Silver Medal, and Honourable Mention awarded at the Paris Exhibition, in competition with all the World.

FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

HIGHEST AWARDS FROM THE MINING INSTITUTE OF CORNWALL.

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ORIGINAL PATENTEE AND SOLE MAKER OF **BLAKE-MARSDEN**

Improved Patent Stone Breakers & Ore Crushers.

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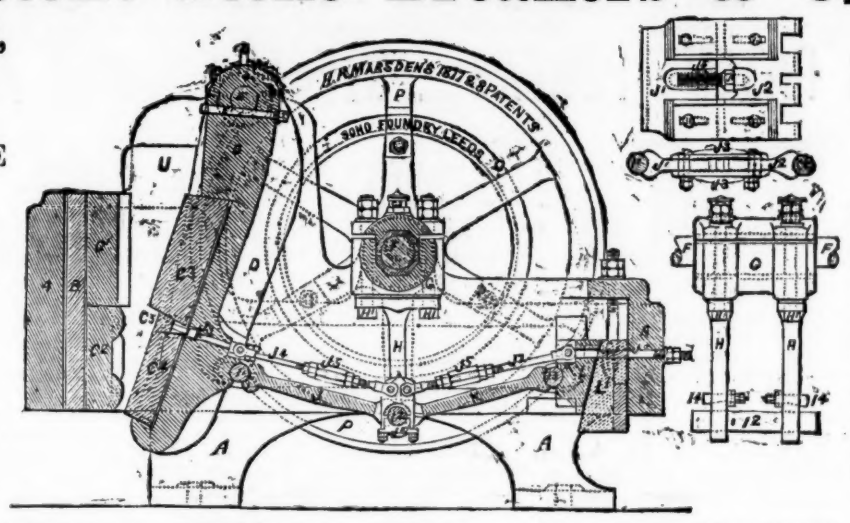

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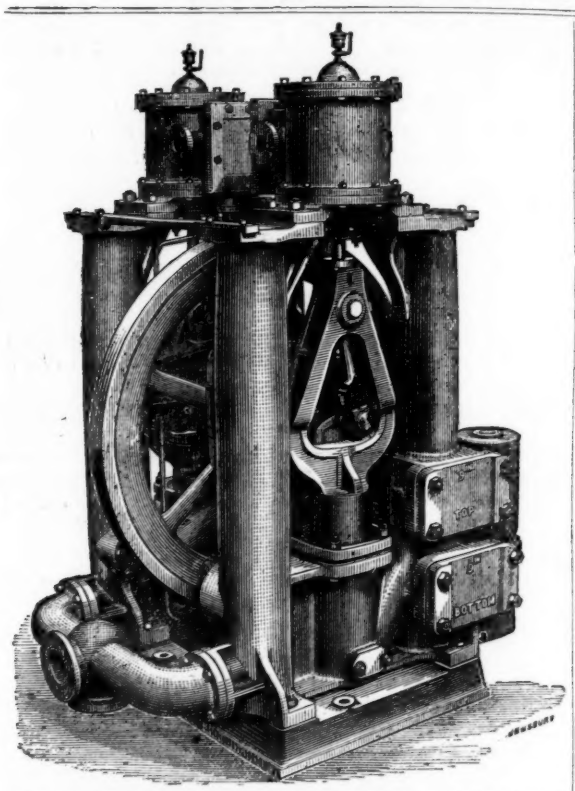

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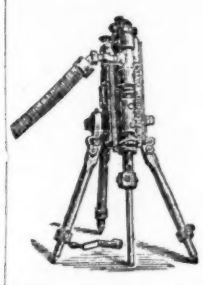

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